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ABSTRACT

This report describes organic curriculum development, the redefinition of goals, and the overhaul of the educational process in the public schools of Mineola, New York. In May 1967, superintendents met in Florida to establish the initial network for the program entitled the Educational System for the Seventies (ES '70). This report reflects the background and working of the program from the point of view of a coordinator. The report includes a prologue which describes the objectives and functions of the program. The program was developed in six pages: 1) building a relationship by the coordinator; 2) diagnosis of the problem, identification of the opportunities, and a look at the system; 3) acquiring relevant resources related to new approaches to instruction and management; 4) choosing the solution; 5) gaining acceptance for the innovations; 6) stabilizing the innovation and generating self-renewal through a positive attitude, an internal subsystem to bring about change, an active inclination to seek external resources, and a perspective on the future. The project's greatest success appears to be in establishing a climate for change in the school district. Surveys, newsletters, an 83-item bibliography, and supporting documentation concerning the program are included. (Related Documents SP 005 662 and SP 005 657 are ES '70 developments in other schools.) (MJM)

FINAL REPORT

Project No. 8-0160

Grant No. OEG-0-8-08160-2668(085)

COORDINATION OF ORGANIC CURRICULUM DEVELOPMENT IN THE PUBLIC SCHOOLS OF MINEOLA, NEW YORK

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U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

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PROLOGUE

In May, 1967, Dr. Ben Wallace, Superintendent of Schools, Mineola, New York, accepted an USOE invitation to meet in Fort Lauderdale, Florida, to discuss the paper, "Designing an Organic Curriculum". At this meeting it was the decision of those in attendance to establish a network of schools who would work cooperatively, under USOE guidance and direction, to bring American education closer to the goals enunciated in the Bushnell and Morgan paper. The participants agreed to the appellation of "ES '70, An Educational System for the Seventies". Preliminary machinery was set in motion to develop a workable structure for the consortium so as to enable the local-state-federal partnership to function fluidly when other such efforts had bogged down. The accomplishments of the network are chronicled in other documents and no effort will be made to embellish upon them here.

Dr. Wallace reviewed the invitation with his Board of Education who, in turn, indicated their willingness to participate. At that time Dr. Wallace appointed Eliot G. Spack to serve as Mineola's coordinator of the "Organic Curriculum" program.

At the inception of the project the objectives and procedures were identified as follows:

Objectives:

The overall objective for the organic curriculum is to redefine goals and overhaul the educational process; therefore, objectives for each full time program coordinator should include:

1. Delimit general purposes of the organic curriculum to the local school districts. Modification of general purposes to fit the local district will be necessary since each district and each teacher and each administrator will be different. These general purposes are as follows:

   a. Integrate academic and vocational learning by appropriately employing vocational preparation as one of the principal vehicles for the inculcation of basic learning skills. In this way learning could be made more palatable to many students who otherwise have difficulty seeing the value of a general education.

   b. Expose the student to an understanding of the "real world" through a series of experiences which capitalize on the desire of youth to investigate for himself.

   c. Train the student in a core of generalizable skills related to a cluster of occupations rather than just those related to one specialized occupation.

d. Orient students to the attitudes and habits which go with successful job performance and successful living.

e. Provide a background for the prospective worker by helping him to understand how he fits within the economic and civic institutions of our country.

f. Make students aware that learning is life--oriented and need not, indeed must not, stop with his exit from formal education.

g. Help students cope with a changing world of work through developing career strategies which can lead to an adequate level of income and responsibility.

h. Create within the student a sense of self reliance and awareness which leads him to seek out appropriate careers with realistic aspiration levels.

2. Deal with a variety of complex questions which may arise from a radical remodeling of the secondary curriculum. To illustrate, what role secondary teachers will play in the teaching-learning process; how will the local school deal with accreditation standards and course requirements that have been established by state statute; what specific behavioral objectives should be identified; which instructional media and technical innovations will contribute most to efficient, effective, and relevant learnings; what is the proper relationship between vocational and academic aspects of the curriculum; what are the most effective means for self-learning through individualized instruction and learning?

3. Develop a tolerance for turbulence while establishing a climate for change. As equally challenging as dealing with the above questions and inherently a part of their solution, is preparing a climate for, and bringing about, change in the attitudes and behaviors of people. For example, the program coordinator must creatively developnew in-service teacher training programs. For the curriculum to be learner-centered, as opposed to teacher-centered, teachers themselves must see the desirability of change. The program coordinator must be one who can work in a dynamic environment and tolerate some turbulence throughout the educational establishment. Indeed, when one considers the security and stability the teacher has established after years of experience in a traditional learning enviornment, this is a most challenging personal objective for each program coordinator.

4. Develop an integrated comprehensive curriculum for grades nine through twelve. Only by a professional educator giving his full time to the program, will relatedness or gestalt be recognized by observers both inside and outside the local program. A full-time educator should be able to step back at times, reflect, and take a birds' eye view. He should see the school as one of many complex social institutions. He should be intimately involved

in all aspects of the curriculum as it develops. He must continually determine which learning experiences are most relevant. To provide articulation, he must study the years which precede grade nine and those that succeed grade twelve. A full-time individual in this position should continually relate all dimensions of the curriculum--keeping each in its proper perspective.

5. Act as an agent for communication. Throughout the development of the curriculum, the program coordinator should continually relate and apply relevant information from the network of schools, private agencies and foundations, the state departments of education, the U.S. Office of Education, universities, and other sources of educational research data, to his local school district. At the same time he bears primary responsibility for informing the above entities about the progress of activities and programs within his school district.

6. Evaluate each step of the program. The program coordinator must establish criteria and effective measurement instruments. It is his responsibility to appraise the entire curriculum-making process. In addition, he must evaluate programs and research information outside his own school district. All aspects of the program must be subjected to tests of philosophical and psychological consistency.

Functions

In order to adequately accomplish the above objectives, the project coordinator should possess the ability for performing the following tasks:

1. Specify and evaluate behavioral objectives for the local school district. The coordinator, working with organizations providing consultative assistance, should draw from behavioral objectives prepared by a variety of sources outside his own district. Together, they must constantly assess the extent to which the curriculum is defined in behavioral terms. They will be involved in using and modifying those objectives that are locally applicable as well as preparing them specifically for the local district. To establish specific behavioral objectives, some of which will be uniquely applicable to the local district, it will be necessary to analyze behavioral requirements which are measurable and can be evaluated on the basis of established criteria. In short, the program coordinator, with assistance, must decide to what extent local project objectives have been accomplished. There are two related aspects to the problem of valid evaluation; first, evaluation of the local program, and second, evaluation of individual student growth.

2. Select and develop instructional materials and media. This involves identifying material and media from educational research which have been found empirically to make important contributions to the learning process. It also implies that the coordinator, with consultative assistance, continually acquaint himself with, and evaluate, new additions to the growing fund of information in educational technology. To illustrate, there is currently a spate of research data about individualized instruction: therefore, the following question must continually be asked: Is it applicable to the organic curriculum in my district?

3. Become involved in training programs within and outside the local school district. Outside his local district, the coordinator must be available to participate in training conferences and meetings sponsored by the Office of Education and other organizations. At times, he will visit various curriculum projects. He must be willing to learn from these activities and apprise appropriate personnel within his district. In other words, he must learn, and he must teach what he has learned. For example, he will be responsible for conducting several in-service training programs for the purpose of developing the organic curriculum.

4. Analyze the present nine through twelve curriculum. Before change toward an organic curriculum can be brought about, the coordinator should become familiar with all aspects of the present secondary program. Carnegie units and course requirements will be modified. A study of existing class sizes and class schedules will aid in planning individualized programs. The backgrounds of ninth-graders entering the program should be determined by examining academic and social factors.

5. Establish relationships and communications with the community. A systematic study of the community should provide information about the nature of the curriculum. What are the projected job needs in the near future? What employment opportunities will exist? What community colleges, four year colleges, or technical institutes have been enrolling graduates from the local districts? What entrance requirements will have to be met? Will the organic curriculum meet these requirements? What is the social structure of the community?

6. Define the tasks and roles of community elements. These may include industrial leaders or instructors from industry who can play a vital role in the organic curriculum. In order to carry out this and the above functions, the coordinator will be a liaison between the community and school. The role here will involve drawing resources and information from the community and informing the community about the progress of the curriculum. He may become associated with a wide variety of community organizations. The

coordinator also will be responsible for selecting and describing the functions of those who will be most closely involved in the implementation of the curriculum - teachers, administrators, guidance counselors, consultants, etc. He will also be responsible for coordinating the curriculum with activities and requirements of his state department of education.

7. Plan and Try-Out the Program in the slected school within the district. The program coordinator along with the superintendent and his staff is charged with the responsibility for seeing that the organic curriculum works. Planning involves interpreting information and the results of work done by other schools in the network and other agencies to the local system when appropriate. As the program is implemented, it must be subjected to continual evaluation by empirical means. Based on the feedback from the evaluation, the coordinator should provide constant revision. Throughout development, implementation, and evaluation of the local program, there should be national coordination.

This report will help to ascertain the degree of success accomplished in the conduct of the project.

INTRODUCTION

A great deal of time has been spent in considering the optimal format to be used in the preparation of this report. Consideration has been given to the purposes to be served, the target audience, and, of course, the contractual responsibilities of the grantee. The writer has determined that a straight chronicled narrative history would, in fact, only serve to augment the archives. A more valuable presentation might be made in relation to the conduct of a change agent in a public school setting. It is to this theme that the body of this report will be directed.

Of the many outstanding studies and reports in the area of "change" which have emerged over the past decade, the most singular contribution, in the author's judgment, has resulted from the work of Dr. Ronald G. Havelock of the University of Michigan. In his 1970, A Guide to Innovation in Education, Havelock provides an invaluable service by carefully defining the many key elements in the process of innovation and in suggesting role models for the change agent. This is followed by the development of a six-stage model which will serve as the basic categorizing feature of this report. The six steps are as follows:

1. Building a relationship
2. Diagnosing the problem
3. Acquiring relevant resources
4. Choosing the solution
5. Gaining acceptance
6. Stabilizing the innovation and generating self-renewal

Havelock identifies two ways to examine stages of innovation. One way is to see it from the point of view of people who are being changed and the other is to see it from the perspective of the change agent. This latter perspective forms the basis of this report and assumes there are three primary ways in which a person can act as a change agent. He can be

1. a catalyst
2. a solution giver
3. a process helper

1. The Change Agent as CATALYST

Most of the time most people do notwant change; they want to keep things the way they are even when outsiders know that change is required. For that reason some change agents are needed just to overcome this inertia, to prod and pressure the system to be less complacent and to start working on its serious problems. In education today this role is often taken by students, concerned parents, or school board members. They do not necessarily have the answers, but they are dissatisfied with things the way they are. By making their dissatisfaction known and by upsetting the "status quo," they energize the problem-solving process; they get things started.

2. The Chenge Agent as SOLUTION GIVER

Many people who want to bring about change have definite ideas about what the change should be; they have solutions and they would like to have others adopt those solutions. However, being an effective solution giver involves more than simply having a solution. You have to know when and how to offer it, and you have to know enough about it to help the client adapt it to his needs.

3. The Change Agent as PROCESS HELPER

Probably the most important change agent role is that of helper in the processes of problem solving and innovating. That is what this book is all about. It tells you HOW change comes about in individuals and organizations. Because most clients are not experts on the "HOW TO" of change, they can be helped greatly by people who are skilled in the various stages of problem solving. The process helper can provide valuable assistance in:

(a) showing the client how to recognize and define needs
(b) showing the client how to diagnose problems and set objectives
(c) showing the client how to acquire relevant resources
(d) showing the client how to select or create solutions
(e) showing the client how to adapt and install solutions
(f) showing the client how to evaluate solutions to determine if they are satisfying his needs

(Extracted from Havelock's, A Guide to Innovation in Education, Page 7)

STAGE 1 BUILDING A RELATIONSHIP

The decision to appoint an insider to the position of coordinator earned certain benefits. The coordinator was already familiar with the system and in a position to feel its problems deeply. He was also a familiar face and a "known quantity".

The coordinator began one phase of his task by examining the "client". As a teacher, the client had generally been regarded in a limited sense as the student. At this stage the client became a much larger entity--it included the total community; parents, students, teachers, clerical workers, custodians, etc. Any effort to bring about change would have to take all these "publics" into consideration.

Early efforts were launched to seek answers to these questions: Who are the leaders? Who are the influentials? Who are the gatekeepers? With whom should I choose to work? An analysis of these issues produced an extension into the larger social environment. Steps were taken to identify the norms in the community, isolate the influentials in the community and establish a picture of the community leadership.

In building this relationship, the coordinator achieved the following:

1. Conducted a faculty survey
2. Reviewed available data on community (demographic, economic, sociological aspirations)
3. Visited with principals of all schools in the district
4. Served on district administrative staff
5. Served on district curriculum council
6. Met informally with all school departments
7. Spoke before PTA groups
8. Addressed faculty at conference day programs
9. Completed an extensive local district analysis
10. Became a resource person for innovative-minded staff members
11. Assisted faculty in generating proposals and new ideas
12. Contributed relevant materials to school professional library

The "relationship" stage was critical in light of the need to redefine an existing relationship where the coordinator was moving out of a previously held role with which the client system had him firmly identified. For some people, the adjustment created no difficulties. For others, it became a "wait and see" situation.

for several, the involvement with a federal project produced skeptical and cynical predictions. It became obvious that the relationship would be enhanced in direct proportion to the deliverability of the individual.

Havelock has identified nine characteristics of a change-agent/client relationship that comprise an ideal base from which to launch the innovation process. Although they were not all apparent at the outset, they are very much recognizable and endorsed at this time.

1. Reciprocity
2. Openness
3. Realistic expectations
4. Structure
5. Expectations of reward
6. Equal power
7. Minimum threat
8. Confrontation of differences
9. Involvement of all relevant parties

It is critical to consider the necessity to build relationships with <u>all</u> client groups in the system. To favor one at the expense of another may prove to be suicidal. Careful effort must be taken to analyze all the elements and sub-groups in the system in order to be assured of maximum exposure and identity. The "established groups" are usually well known. However, careful attention must be directed at the avoidance of offending any group who may be influential.

The coordinator used several vehicles to build his relationships. A variety of strategies were employed with a high degree of success. Where identification with the Central Office was required, it was provided and was utilized. Where entre' was needed to the general public, an appropriate linkage was sought. Similarly, various techniques were employed to meet the required situation.

STAGE 2 DIAGNOSIS

Too often the educator has been misguided by a sense of impatience and has eagerly moved on to solutions without pausing to look around to examine the system. Educators have suffered drastically from a reluctance (or inability) to perform adequate diagnoses. Diagnosis is defined simply as a systematic attempt to understand the present situation. A good diagnosis is a description of the client's problem which includes the essential details of symptoms, history and possible causes. Extracting the diagnosis is often a difficult task for it requires a type of deductive process starting from the client's pain (his feeling of need) to a defined problem stated in such a way that both the change agent and the client can work rationally on a solution.

Research identifies three ways to approach a diagnosis: one is to identify the problems, two is to identify the opportunities and three is to look at the client as a system, a set of elements that are supposed to work together to achieve some common goal. This coordinator chose to employ all of these approaches where the appropriate technique fit. A key feature in conducting a diagnostic inventory was the utilization of five key questions as they helped to define the system.

1. What are the system's goals?
2. Is there an adequate structure for achieving these goals?
3. Is there openness in communications?
4. Does the system have the capacities necessary to achieve its stated goals?
5. Does the system reward its members for working towards its stated goals?

In attempting to conduct this diagnosis, the coordinator relied upon a wide variety of techniques and practices. Some evidence was apparent as a result of previous service in the school district. Other data emerged through an analysis of the district's programs for the past decade. Still, other information required penetrating study and in-depth analysis.

Strategies used in this process included the following:

1. Conferences with the Superintendent and other district administrators
2. Meetings with parent groups and the Board of Education
3. Examination of district publications and brochures

4. Analysis of personnel practices and professional negotiation contracts
5. Investigation of vehicles of policy-making and sharing of ideas
6. Analysis of Cooperative Review Surveys and accreditation reports
7. Conference day programs with sessions structured to elicit diagnostic data
8. Faculty surveys
9. Small group faculty coffee hours
10. Formation of an ES '70 Steering Committee
11. Visitations with individual teachers and department sessions
12. Working with student groups

STAGE 3 ACQUIRING RELEVANT RESOURCES

The entire area of information retrieval has blossomed forth in the past decade. Knowing when, where and how to acquire resources are essential skills for any change agent to have. It is within this stage that the local coordinator has demonstrated his strongest service to the client. Much of the success accomplished can be attributed to the contributions made in this dimension.

Havelock's study identifies seven major purposes for resource acquisition. They are summed up in the acronym "DAETEIM": Diagnosis; Awareness; Evaluation-before-trial; Trial; Evaluation-after-trial; Installation; and Maintenance. This formula corresponds roughly to the process of planned change as it is experienced by the client system.

In an attempt to offset any feelings of insecurity in his new role, the local coordinator attacked his new assignment with great zeal. The initial focus centered on an immersion into the literature on the process and dynamics of change. Many bibliographies were gleaned in order to identify the most current and relevant sources. Several months were devoted to this immersion experience and the value of the undertaking was reflected in later results. The apostles of the past were valuable prophets of the future.

To supplement this early library exercise, the coordinator began to build and maintain a broad span of awareness of the outside world. This was defined as establishing and maintaining meaningful human links with other school systems, universities, state education departments, regional laboratories, regional centers of various sorts and resource mechanisms of the various professional associations, foundations and the U.S. Office of Education. Correspondence was initiated with many of the above agencies, interviews were held, subscriptions to key journals were instituted, visitations were conducted and phone conversations were undertaken. The coordinator became very much aware of new educational programs, innovative hardware, special training programs as well as the various gatekeepers at the state and federal levels.

A most significant linkage system was established with representatives of the private sector--industry and publishing. Key representatives at high levels of major companies were anxious to be on the "in" with any innovative-minded program. Consequently, several sessions were held with representatives of RCA, Norelco,

Learning Research Associates, MIND, Inc., and many other companies. In several cases this led to an on-going relationship which has continued to this day.

The coordinator began to accumulate resource materials related to exciting new approaches to instruction and management. Teachers anxious to test out new theories found a friendly ear as well as new sources to investigate. A professional library on innovative practices soon emerged and it became a focal point to attract staff members who felt a need to consider alternatives to their present mode of operation. Visits to other school districts led to an accumulation of sample curriculum materials to be shared with Mineola teachers. Attendance at stimulating conferences often led to additional inquiries and new linkages with people who had valuable contributions to make. Announcements of new hardware or software were circulated to faculty members often leading to preview examinations. Entries in various educational publications were followed up for additional explanatory materials or samples. Announcements of NDEA or EPDA institutes were quickly brought to the attention of the faculty so as to give personnel early notice.

The coordinator was quickly identified as the "expediter", the resource person, the linking agent. Such an appelation proved extremely valuable in establishing a type of relationship which enabled the Mineola coordinator to establish credibility with many staff members who might have required further evidence before they demonstrated a willingness to cooperate.

The coordinator assumed the responsibility for conducting and organizing local in-service programs. Once again contacts with other agencies helped to identify valuable instructional aides. Included in those programs were the VIMCET and PPIT materials. A full in-service course for faculty was conducted by Dr. Esin Kaya of New York University. Conference day programs were structured by the coordinator with the use of such resource people as Dr. Bertram Spector, Dr. Thorwald Esbensen, Mrs. Sadie Hofstein and Dr. Sidney Simon to assist staff members in refocusing their priorities. Training institutes were identified at other locations to which several faculty members became enrollees. These included Duluth (1968); Willingboro and Duluth (1969); New York Institute of Technology (1968); Harvard Project Physucs (1969); Achievement Motivation (1970). These experiences proved to be invaluable in enabling people to examine new perspectives and dimensions that were previously unfamiliar to them. As a catalyst they proved to be highly effective.

The coordinator became somewhat of a travel agent, arranging visitations to other ES '70 school sites for members of the professional staff. During the project period the coordinator visited almost all of his counterparts across the country. Several faculty visitation teams were dispatched to other locations to stimulate their thinking. Sites visited included: Quincy, Mamaroneck, Duluth, Bloomfield Hills, San Mateo, San Antonio, Nova (Fort Lauderdale), Santa Fe (Institute of American Indian Arts), and Portland. Visiting teams were carefully briefed prior to their inspection trip with follow-up debriefings held to incorporate their perceptions. Emphasis was placed carefully on the avoidance of replication of what was seen. In several situations our visiting team members tried to duplicate back home the models they witnessed.

As the coordinator broadened his base of information, he became a very much sought-after resource person both in and out of the District. Several district principals invited him to speak with their faculties and PTA organizations. Invitations came from surrounding school districts to speak with teachers, administrators, planning groups, curriculum teams. In addition, the coordinator was invited to speak to college classes, study groups and professional associations.

The acquisition of relevant resources continued to grow. Favors for one party led to reciprocity and this type of exchange helped to update the files and shelves. Contacts with USOE and state education department personnel led to many valuable resource linkages. ERIC indexes were gathered, PREP publications received, bibliographies developed and reference materials circulated. The local coordinator was responsible for encouraging a local research library to establish a standing order subscription to all ERIC documents. It soon became obvious to many that even if the local coordinator did not have the desired resource material, he would surely know where to secure it. It was this type of confidence which helped to cement the positive relationships which were being developed through the life of the project.

STAGE 4 CHOOSING THE SOLUTION

The Havelock model suggests a four-step sequential process that could be used in choosing solutions, starting from diagnosis and information retrieval and working through to a point of implementation. The four steps are:

1. Deriving implications from research
2. Generating a range of solution ideas
3. Feasibility testing
4. Adaptation

In the Mineola setting the coordinator saw his role as a catalyst to promote change. Carefully he avoided any suggestion that a particular innovation was the solution or panacea to man's problems. The activities of the development period were designed to examine a variety of alternative ways to bring about a more learner-responsive instructional program. No single format or procedure was adopted or held out as a model. Teachers were free to experiment with new approaches as long as they were designed to meet certain criteria focusing on a more individualized orientation. Various methodologies were employed to encourage staff members to innovate. These included opportunities to work on projects during the summer (for pay), participation in visitations, attendance at institutes, access to research and development funds and the general ego satisfaction of being in the limelight.

In accepting the invitation to participate in the ES '70 network, Mineola had agreed to help develop a new comprehensive secondary school curriculum and organization

-----providing an individualized education for each student

-----highly relevant to the adult roles which he will play

-----economically practical within available public resources

-----based on behavioral and related sciences

-----employing suitable systems of school organization

-----utilizing appropriate educationally oriented technology

-----locally planned and directed

-----state supervised, nationally coordinated

-----financed by federal, state and local funds

-----designed for ultimate availability to all school systems.

To that end, the faculty members of Mineola High School began to focus their attention on the development of an instructional program which met the criteria of being more learner-responsive and individualized. The following elements were identified as key items in the determination of the individualized components of any new program:

1. provide for an individualized instructional program for all students
   a. utilize a variety of instructional strategies to accommodate this approach
   b. employ a sophisticated activity of diagnosis and prescription
   c. develop a curriculum formulated upon behavioral objectives with accompanying statements of performance criteria
   d. employ modular arrangements of instructional materials which permit the learner to study materials relevant to his career goals at a pace consonant with his ability

2. be highly relevant to the adult roles which students play
   a. cluster arrangements of vocational careers which enhance the choice of possible career patterns rather than limiting it to a specific trade or field will exist
   b. industrial, commercial, and higher education entry level skills will be provided in a way which will offer true options for the learner

3. result in a merger of the academic and vocational aspects of the curriculum into a comprehensive program of education

4. utilize appropriate educationally oriented technology
   a. proven technological and electronic devices and systems will be widely used as a necessary component of an individualized instructional program which is economically feasible
   b. machines will assist the learner to assimilate material at his own rate
   c. computers which can serve large numbers of students will be increasingly involved as an integral part of the instructional program

5. require a new emphasis on career orientation and counseling

6. employ new systems of school organization and flexible scheduling patterns

   a. through computer utilization a system will allow program changes to be made to meet student needs on a quarterly, monthly, weekly, or even a daily basis

   b. management decision-making will be enhanced due to the simulation possibilities of sophisticated data processing

   c. school facilities will provide fewer traditional learning spaces and more small group and individual study areas

7. develop new staffing patterns within the school and require new roles for professional and para-professional staff

   a. professionally trained teachers, certifiable in accordance with local and state laws and procedures will be the core of the instructional teams

   b. professional personnel from the community who serve other social, governmental, and private agencies as well as business enterprises will be a major element of the instructional teams

   c. non-professional personnel will become an increasingly evident component of the instructional team. As the professionals become more aware of ways to utilize the talents of the non-professionals, a hierarchy of non-professional jobs from the teacher aide to the educational and technological assistant may well develop

8. incorporate sophisticated information storage and retrieval systems to maintain current records for guidance and student information

9. require extensive in-service training and revised pre-service training

10. be economically practical within available public resources

11. incorporate provisions for frequent evaluations and modifications

Since the inception of the project, the following programs have been developed and are in some stage of implementation at Mineola High School. Their existence is in most cases directly attributable to Mineola's participation in the innovative network.

1. Learner-Centered Mathematics

   Financed with ESEA Title III funds, this three-year effort has developed a highly sophisticated program in mathematics which provides for diagnostic procedures, self-pacing, multiple option learning activities, and regular evaluation procedures. By a gradual process of internal conversion, it will become the full mathematics program at Mineola.

2. Writing Skills

   An individualized approach to communications which incorporates diagnostic procedures with appropriate prescriptions based on learner's status.

3. General Science

   Opportunities for learners to engage in physical science study in a more personalized, self-paced manner.

4. Music Theory

   A program to allow students to start "where they're at" in this field and, with the use of a programmed course, move ahead as their own speed permits. Students are not required to restrict their instructional time to a 45-minute class period. Study halls, free periods and home use are encouraged.

5. Humanities

   A senior elective, this program incorporates the elements of art, music and poetry into a fluid program where each student completes units of study in each field with a culminating experience of creative expression.

6. Social Studies 10

   The entire sophomore social studies program has been converted to a unique experience which allows students to operate in a more flexible environment with a greater sense of responsibility for learning focused on the individual student. Using the contract

approach students are expected to achieve stated objectives using a variety of activities which are developed in accordance with a variety of need systems and learning styles.

7. Recordkeeping

This area of business education has been converted to allow for students to have a greater selection in their use of materials. Relevancy is incorporated by working with forms and materials provided by local businesses.

8. Mineola Arts Project

Assisted by an extensive grant from the JDR 3rd Fund, the entire school district has become heavily involved in the development of a new approach to the arts. Curriculum units based on aesthetic processes are being prepared to support a unique program of arts events which is designed to develop an arts program for all.

9. Independent Study Projects

Many teachers have begun to recognize the variety of individual differences prevalent in their students. This perception has produced new approaches in the areas of Advanced Biology, Problems in Democracy, Reading and Electronics.

10. Red Reflections of Life

Capitalizing on the relationship established with the Institute of American Indian Arts in Santa Fe, our school district has produced a film which helps to probe the issue of cultural identity sought by the American Indian. This will be augmented by additional work in building a cultural matrix to be applied to further studies of cultures.

11. Exploration of Cable TV

Capitalizing on our pioneering work in educational/ instructional television, serious deliberations are now underway to develop a total communications system designed to serve the total community. Provision will include a two-way system with programs emanating from the school source with provision for a viewer to respond. Computer support will provide data storage and monitoring assistance.

12. Career Development

A recently announced New York State grant will enable Mineola to develop a K-12 career development and orientation program. Linkages with state officials established in this project were instrumental in opening conversations on this topic.

13. Computer Management

Our staff has begun to work cooperatively with New York Institute of Technology to build a management system to support our highly complex individualized programs. Using the rather sophisticated AIMS program, efforts will be launched in 1971 to provide for student diagnosis and prescription by computer with full reporting procedures available.

14. Total District Redesign

Although not totally attributable to this project, Mineola's efforts to build a totally learner-responsive instructional program have been highly stimulated by work undertaken under the impetus of this project. All elementary schools have joined with the two secondary schools to the building of a district-wide program which incorporates the features enunciated earlier.

Each of the above "solutions" has been developed locally with local talent sometimes assisted by external funds. The staff has been intimately involved in the design, development and conduct of the program. Very few attempts have been made to adopt externally prepared programs with customized treatment. These efforts reflect a great deal of personal commitment and enthusiasm of the developers and this has contributed greatly to the maintenance of a climate of excitement. With so much activity there is rarely any suggestion of stagnation in any of our instructional programs

STAGE 5 GAINING ACCEPTANCE

In Havelock's model this stage focuses on the actual installation of the innovation. He is quick to identify that this phase represents the heart of the plan for change; during this phase all the preparatory work is put to the test and one discovers whether or not a workable solution has been developed which is acceptable and useful for all members of the client system.

Since the previous section identified as many as fourteen separate "solutions", it would be extremely tedious to examine each of them in response to acceptance. An attempt will be made to capsulize some of the research and propose some generalizations of the Mineola experience. Researchers have identified six phases in the adoption process: awareness, interest, evaluation, trial, adoption and integration. The change agent tries to facilitate each of these processes. In dealing with individuals he tries to coordinate activities with the adoption stages of the potential adopters. One tries to understand where potential adopters are in terms of the phases so that he can try to be with them, not ahead or behind. One should be prepared to go back as individual adopters slip back and to keep ahead as individual adopters jump ahead, and one should know when to switch from one mode of communication to another with each adopter.

"It is impossible to comprehend how individuals adopt without also considering the social relationships and group structures which bind individuals together. The communication of innovations depends upon a vast network of social relationships, both formal and informal; a person's position in that network is the best indicator of when he is likely to adopt an innovation." 1/

The coordinator corroborated the warning of researchers that three types of people play a significant part in generating group acceptance. These groups are the "innovators", the "resistors" and the "leaders". Mineola has its share of all three types and various strategies were devised in order to deal with the diversity. In many cases success was achieved, in others resistance still exists.

The educational system is a highly complex social system which is composed of a wide variety of clients to be served. As agents of the community we, of course, are responsible to the adult taxpayers who have created the schools and who support them via tax levies. Their acceptance is critical to the continued support of educational improvement in an age of inflationary costs and economic belt-tightening.

1/ Havelock, Guide to Innovation in Education, Page 129

The Mineola adult community has always placed great faith and confidence in their school leaders. A strong middle class community with a conservative bent, the parents have continually supported education as a means of social and economic elevation. Budgets were usually passed with little challenge, new programs were greeted with acceptance and changes were regarded as appropriate if endorsed by those in leadership roles. An authority-based community, the people were usually willing to place educational decisions in the hands of those whom they trusted as being more expert.

Recent social, political and economic trends have produced a significant departure from the laissez-faire attitude. This condition, augmented by the shape and form of many innovations, began to produce a greater sense of awareness and involvement on the part of parents. Faced with burgeoning costs many people began to challenge what had previously been regarded as sacred territory. Another key feature also triggered an element of challenge. Many recent school innovations struck drastically at the parents' basic conception of what schools were all about: new terms such as non-graded, individualized, multi-media, technologically-oriented, provided a sense of uneasiness. Changes in report cards, grading systems, use of television, independent study programs, student dress habits, rap sessions, and narcotics problems all produced a growing suspicion over the transition taking place in their schools. The image of the past--the school which emphasized discipline, the 3R's and regimentation--seemed to be rejected, a relic of a past civilization. In replacement of the virtues of the past, parents were advised that students were being prepared to become independent learners, to develop values of their own, to meet the challenges of the 21st Century, to learn to make decisions and be responsible for their own behavior.

It is to this turbulent environment that the innovations described earlier were introduced. For the most part, parents have been accepting. However, the era of silent acceptance has passed. Board meetings receive frequent questions relating to the introduction of new programs, PTA meetings reveal parental concerns, letters and phone calls to school display similar attitudes.

Orientation sessions have helped. Publicity materials have been circulated. Community-wide meetings offer another source of information. Yet apprehension, anxiety, skepticism and suspicion remain. The parents recognize the reason for their discomfort yet they still are concerned. Our task is to keep them informed on every phase of our redesign effort and to involve them whenever possible. Their limited agitation has put the educational community on notice that the public is watching. The key will be the channeling of that spirit into cooperative action.

A second component of the system is the students. Although generally accepted as the most malleable element in the strata, students who attend high school have already been conditioned by 8 to 9 previous years of schooling. For the most part, they were "educated" in teacher-centered classrooms with almost total reliance on the instructor as the ultimate source of all knowledge. Grades were awarded for mastery and retention and classroom settings were usually quite rigid.

With this background, students were now introduced to several programs where they were expected to be responsible for their own learning. Faced with a future requiring substantial decision-making, students were placed in flexible environments where they were allowed to manage their own time, select their own materials and choose their own priorities. Many performed beautifully--given their freedom, they blossomed into independent learners. Many were skeptical and struggled along trying to find themselves in the maze of independence. Others rebelled--claiming inadequate guidance, lack of textbooks, no teaching taking place, and unconducive learning environments as impediments to their achievement. We learned valuable lessons regarding student readiness and have tried to marshal student interest in a positive way. Student dissatisfaction took the form of petitions, protests, meetings, appeals to parents, letters, etc. The faculty worked with student dissenters in a constructive way in an attempt to meet their objections to the program by making modifications. What, of course, became apparent was that the student agitation displayed was the very type of behavior that new programs were aiming to achieve--independence, environmental control, the ability to influence public policy and concern for one's personal future.

The third element in the client system is the teachers. This is a group which offers great diversity owing to many variables operating upon it. In addition to the basic issues of philosophy, general orientation, age, security, status, self-confidence, etc., one other major feature imposed a new dimension to the area of teacher acceptance. I refer here to the growing sense of teacher militancy which has been developing across the country and has been very active in Long Island. The advent of collective bargaining and negotiations have introduced a new era in educational decision-making. The struggle for power is evident--the question is who will emerge as victorious, what scars will remain and how will the students be effected?

The involvement of Mineola in this project was strictly an administrative decision. Teachers were not counseled or advised until it was a fait accompli. For several reasons this made many people skeptical. Early rumors of the project stressed technological

emphasis and many people displayed the cloak of insecurity. References to behavioral objectives and task analyses raised the challenge of the humanists. Terms like "cost effective", "differentiated staffing" and "computers" caught the attention of militant-minded members of the profession.

Yet, in spite of certain senses of uneasiness, the faculty cooperated extremely well in the conduct of the program. The key was the absence of coercion. Nobody was forced to do anything he didn't feel comfortable doing. All new projects were staffed with volunteers. People offered to participate on their own initiative and with no fear of failure being a threat to their survival. Incentives were offered as an inducement to innovate but no penalties were assigned for resistance. Those who attempted alternative arrangements to the conventional classroom setting were given full support by the administration. This included additional funds, exemptions from certain policies, specialized training, unique classroom environments, etc.

Faculty involvement in the design and development of new programs eliminated any suspicion that this would be a program imposed from without. Local teachers became the proselytizing agents of their own programs thereby reducing any attempt to blame innovation on administrative mandate. In many situations of tension (faculty meetings, PTA sessions), the teachers involved in new programs assumed full responsibility for their defense. The coordinator, once recognized as the catalyst and lone agitator, now felt secure that his disciples could operate well in his absence.

Although the process of adoption by teachers went smoothly, the militancy previously described left their wounds and scars. Several early innovators were labeled as "tools for the administrators" and many truly dedicated people suffered personal abuse which embarrassed the profession. To their credit, however, they resisted the muscling tactics of their critics and proved their merits by performance. Still at odds, however, are the issues of differentiated staffing and new patterns of organization which can blossom into new areas of divisiveness.

STAGE 6 STABILIZING THE INNOVATION AND GENERATING SELF-RENEWAL

Although this is a legitimate stage in the innovative process, it is indicated here only as a means of identification. The short-term nature of this program has hardly produced a sense of stability or opportunity for self-renewal. It is no doubt a very important consideration to be concerned with the continuance of a particular innovation once it has been accepted by the client as well as the concept of system self-renewal. However, very little has been demonstrated to date under this phase.

For those projects which have been in operation the longest, some techniques have been employed to assure continuance. These could include continuing some type of positive reinforcement or reward system for the participants, continuing evaluation and monitoring and structural integration into the system. One fear does remain which requires caution. In many cases, the innovator becomes so deeply attached to his project that his emotional involvement overcomes his rational processes. The client should retain the flexibility and the freedom to discontinue an innovation when something better comes along.

Havelock enjoins the change agent to be ever mindful that the client should learn to be a change agent for himself. To this end he urges that a self-renewing system will have to have four built-in features. First, it should have a positive attitude toward innovation in general. Second, it should have an internal subsystem which is specifically devoted to bringing about change. Third, it should have an active inclination to seek external resources. Fourth, and finally, it should have a perspective on the future as something to plan for. 2/

2/ Havelock, Guide to Innovation in Education, Op. Cit. p. 153

EPILOGUE

The activities of the local coordinator in the development of this project have been chronicled in the preceding pages. The element of success achieved is always open to interpretation. In spite of grand promises back in 1967, the elements of the organic curriculum program which were to be designed and developed by other contracted agencies were never delivered. Thus, in terms of the project's original goals, as conceived by its USOE creators, the program did not achieve its desired outcomes. However, if considered in the light of empty promises and the many failures to deliver, one cannot help but be impressed by the extent of local accomplishment.

The tenacity of the ES '70 school districts to retain their identity and sense of purpose in the face of parental abandonment is sufficient testimony to their sense of commitment. The record will show that, in the face of USOE disenchantment and a reordering of priorities, when it became obvious that funds would be cut off, the member participants chose to continue the pursuit of their goals by whatever means they could manage. It is significant to read in 1971 the many speeches and bulletins issued by OE Commissioner, Sidney Marland, which highlight the very same priorities and procedures which were devised in 1967 for ES '70 and soon forsaken.

The elements of this report have reviewed the major accomplishments at the local level. The document would not be complete, however, without some reference to the activities played by members of the Mineola school district in providing leadership and cohesiveness to the ES '70 program nationally.

At the inception of the project, in May 1967, Dr. Ben Wallace, Superintendent of Schools in Mineola, was asked to serve as a member of the superintendent's Executive Committee. He, in turn, was chosen from among his peers to be the chairman of this group and later to serve as the President of the ES '70 Corporation when it officially became a non-profit corporate entity. Dr. Wallace provided the early leadership to the infant consortium and gave it stability in its toddler stages. His presidency carried from 1967 to 1969 and in 1969-70 he served as the Corporation's Secretary and as a member of the Board of Directors. During these three years he was aggressively involved in the development of the group's structure, its program and the projection of future priorities. He met frequently with representatives of USOE, HEW and other governmental agencies. He assisted in the planning of all ES '70 conferences and worked closely with representatives of E. F. Shelley and Company as they provided management support. It is significant to note that, of the original 14 superintendents in the network, only he remains in the consortium.

The local coordinator in Mineola also assumed leadership functions on the national level. In February 1968, he was chosen to serve as chairman of the coordinators' group and was later asked to serve as a non-voting member of the Executive Committee (Board of Directors). He served as the chairman of several committees and task forces which contributed major documents to the organization. In October, 1969, the Board of Directors appointed him to be their Acting Executive Secretary, a position he has held through 1971.

These historical details are added not for ego satisfaction but to reinforce the local commitment demonstrated by Mineola since its affiliation in 1967. The opportunity for interaction provided by leadership roles proved to be extremely beneficial and enlightening. Linkages and relationships were established which, in turn, led to associations of a protracted nature. Ideas and approaches were discussed and exchanged in an atmosphere of intellectual stimulation and excitement. These opportunities often served as catalysts for local programs and changes.

CONCLUSION

A review of the objectives and procedures which were initially planned for this project reveals a most formidable undertaking. Although each of the thirteen items is in itself a significant undertaking, this local coordinator feels that his greatest sense of accomplishment has been to develop a tolerance for turbulence while establishing a climate for change. Carl Rogers gave sound advice when he stated, "I should like to point to the greatest problem which man faces in the years to come. It is not the hydrogen bomb. It is not the population explosion. It is the question of how much change the human being can accept, absorb and assimilate, and the rate at which he can take it.... Can he leave the static ways and static guidelines which have dominated all of his ways and adopt the process ways, the continual changiness which must be if he is to survive?" The educational institutions of this country have withstood many prolonged assaults since their formation. Innovators have come and gone and still the archaic structure withstands the assault. Many teachers pride themselves in their abilities to resist new approaches--they will outlive the novelties.

The major problem is that most people never faced up to the need for change, let alone the capacity for self-renewal. Innovations and experiments are frequently the brainchilds of experts from outside the system and this makes many teachers suspicious and defensive. To accept another mode of operation is an admission that the present way is obsolete and to many that idea is much too threatening.

Parents and community leaders are also faced with this feeling of discomfort. Although their lives have been changed drastically in the last 20-30 years by the technological revolution, many are unwilling to accept the fact that the same impact must be reflected in our educational system. The same parents who have undergone the transition from the ice chest to the refrigerator, from the horse and buggy to the jet aircraft, from the crystal set to the color TV, are somehow unwilling to see the transformation take place in their sacred social institutions. Many people see education with tunnel vision--designed for limited tasks and to perform certain functions which they deem critical. The recent Gallup poll revealed the public's expectation that discipline be a key function of the school program.

Many parents see the schools as a place for the promulgation of accepted values, not as the arena where new value systems are to be developed. Education has been primarily concerned with "conserving" information, hence, it has behaved in a rather "conservative" manner. The role of the educator/change agent is to

attack these basic issues. All parties must begin to focus on the critical question of education--to what end? for what purposes? No sacred cows exist. All elements of the system must be open to challenge, refinement and possible discard.

Too often programs of educational change are concerned with minutia. New ideas of architecture, scheduling, testing, information retrieval and teacher training all purport to be the panacea to man's problems. Similarly, the various curriculum projects in mathematics, science, social studies, etc., are all designed to reinforce the same basic system. Secondary schools are organized along lines of information--teachers are assigned to departments--examinations are given in content areas--textbooks are distributed to support specified subjects. How long will we continue the game? Who will begin to focus on the "total child"? Who will make the provision to see that each student is prepared not for the 1970's but for the ominous predictions of the 21st Century? Who will protect the learner from an education with built-in obsolescence?

This coordinator has begun to raise such sensitive questions. In many cases people have felt comfortable in their deliberations and others have assumed a threatened posture. Vested interests begin to emerge and defensive positions developed. The role of the change agent is to anticipate these many variables, head them off, if possible, and deal directly with them as they emerge. In Mineola a lot of this has been done and the turbulence has begun to rumble and subside. No pattern of stability has set in nor is one expected. An atmosphere to deal with change militates against the maintenance of stability. The local coordinator now feels that, in a sense, he has organized himself out of a job and that his function as gadfly, heretic and troubleshooter has been assumed by a group of many dedicated disciples.

APPENDIXES

MINEOLA HIGH SCHOOL - ES '70

Faculty Survey

Name_____ Department_____

The success and momentum of the kinds of programs being considered as part of the ES '70 project will only result if there is faculty participat and response. It is for this reason that we invite you to indicate those areas where you would like to participate if you choose to. Provision is made for a simple check to indicate your response but feel free to be more expressive should you desire.

_____1. I would be willing to serve on a High School steering committ for ES '70 (a policy making body).

I would like to nominate the following faculty member(s) to serve on the steering committee.

_____

_____2. I would like to participate in "idea" sessions to consider ne concepts in the secondary school curriculum.

_____3. I would like to assist in the preparation of new instructiona materials as they are required.

_____4. I would like to be involved in the implementation of some of the new programs which are developed.

_____5. I would like to attend or plan workshop sessions on topics of interest to the High School faculty.

_____6. I would like to plan or attend in-service programs on topics relating to ES '70 ideas.

_____7. I would like to participate in visitations to other schools to observe innovative programs in operation.

_____8. I would like to serve on a committee to assess our local prog through the ES '70 program.

_____9. I would like to have the opportunity to spend some time with outside consultants who might visit Mineola.

_____10. I would like further information about:

_____ES '70
_____Behavioral objectives
_____Individualizing instruction
_____achievement motivation
_____Educational technology
_____Other (please specify)

_____11. I do not choose to participate in any of the above ways but would like to be informed of the progress we make.

A.

WEBOLA HIGH SCHOOL - E.S. '70
STEERING COMMITTEE

FUNCTIONS:

1. To participate in programs of orientation, instruction and study of the following topics:

   a. Objectives of E.S. '70

   b. "Organic Curriculum"

   c. "Prospectus for Change"

   d. Necessity for and construction of behavioral objectives

2. To assist in the examination of various school programs and procedures to determine their relevancy and readiness for E.S. '70.

3. To assist in proposing programs of orientation and instruction to the High School faculty.

4. To assist in establishing priorities in the scheme of implementation drawn from an on-going evaluation of present and projected programs.

5. To assist in the identification and selection of faculty members to participate in E.S. '70 projects.

6. To assist in serving as a communications link to all members of the High School faculty on the substance and progress of our E.S. '70 program.

10/9/67

B.

NEWSLETTER

VOl. I NO. 1 MINEOLA PUBLIC SCHOOLS OCTOBER 1967

This is the first in a series of newsletters designed to inform you of the progress of our District in relation to the ES '70 program. The newsletter will take various forms as needs arise but basically it will serve as a communications link to members of the high school faculty with regard to local developments or possibly the dissemination of relevant materials found in educational journals. As materials are accumulated they will be distributed to you and informal discussion groups will be arranged for those who are interested in pursuing the subject matter any further.

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As an appendix to this newsletter, you will find a copy of a paper entitled, "The Organic Curriculum." It was as a result of this study that the formulation of ES '70 came about. As you will determine, the organic curriculum is an attempt to meet the perennial educational challenges in a systematic way, instead of dealing with each innovation as an isolated segment. It proposes to radically change the present secondary education program in the direction of a learner-centered curriculum. The objective of the program is to integrate academic training, occupational training, and personal development in grades nine through twelve. Such a comprehensive program should also draw from past, present and future research in order to maximize individualized instruction.

It would be most valuable if you would take the time to read the paper and make any appropriate comments.

Mr. Spack will be most willing to discuss any of the thoughts found within the paper and, most particularly, to consider their implications for Mineola High School.

A high school steering committee has been formed consisting of volunteers and nominees as indicated by the faculty survey solicited during the middle of October.

The committee will include the following:

Paul Ash
Bob Bernstein
H. Guy Brock
John Connolly
Fred Craden
Merrill Debski
Rhoda Fishkin
Barbara Hobbs
Donald Holquist
Vito Merola
Bob Nadel
Frank Torre
Tony Valeri
Jess Weston
Fred Zusselman
Dr. Ben Wallace, Supt. of Schools
Dr. Henry Rosenbluth, Principal
Bob Dever, Assistant Principal
Al Schutte, Assistant Principal
Eliot Spack, Executive Secretary

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The first meeting of the steering committee will take place on Monday, October 30, at 2:15 P.M. in room 142 at the high school.

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UNION FREE SCHOOL DISTRICT NO. 10
MINEOLA PUBLIC SCHOOLS
200 EMORY ROAD
MINEOLA, NEW YORK 11501

Dr. Ben Wallace, Superintendent of Schools

Mr. Eliot G. Spack, ES '70 Coordinator

EDUCATIONAL SYSTEMS FOR THE SEVENTIES
ES 70
A PROGRAM SPONSORED BY THE U.S. OFFICE OF EDUCATION

NEWSLETTER

VOL. I NO. 2 MINEOLA PUBLIC SCHOOLS JANUARY 1968

STATEMENT OF THE PROBLEM

Albert Einstein has stated, "Education is that which remains after you have forgotten everything you learned at school." What a stirring indictment this is of the schools and what a fantastic challenge this statement offers educators. Einstein apparently sees little value in the thirteen-year effort of the schools to prepare students to assume an effective role in society. In fact, his statement implies that the total effort is wasted.

Why should a brilliant mind like Einstein's react so negatively to the schools? Are schools so poor that students would be better off if they'd never attend? Would they learn more if they were allowed to pursue their own interests -- to go as far as their creativity, imagination, and curiosity would take them? Is this what learning is all about? Is typical school-type learning-read the text, answer the questions, and regurgitate the facts on a test- a shallow mockery of real learning? Does such an approach merely clutter students' minds with bits of useless information- information to be forgotten soon after the test?

If Einstein is right and if school learning is so divorced from reality that it is meaningless, what alternatives do the schools have? Seemingly the first logical step would be to re-examine the school's goals to determine whether they are realistic- whether they'll provide students with the skills they'll need in order to become life-long learners. Eleanor Roosevelt once said, "The world is changing so fast-- all we can hope to do for the young people is to nurture their natural enthusiasm for learning, and help them learn how to learn."

Once realistic goals are established, selection of appropriate methods/materials to attain the goals while meeting the needs of individual students becomes a relatively "simple" task. Meeting the individual needs of students is a simple phrase that we continue to hear with greater frequency but it describes a major problem which confronts every classroom teacher, a problem to which educators throughout the nature have not yet found a satisfactory solution.

Dr. O. H. Reavis, Assistant Superintendent of Schools in Cincinnati, Ohio, has written a humorous fable about individual differences entitled, "Fable of the Animal School." It reads as follows:

INDIVIDUAL DIFFERENCES
"Fable of the Animal Schools"

"Once upon a time, the animals decided they must do something heroic to meet the problems of "a new world", so they organized a school. They adopted an activity curriculum consisting of running, swimming, and flying, and, to make it easier to administer, all the animals took all the subjects.

The duck was excellent in swimming (better in fact than his instructor), and made passing grades in flying, but he was very poor in running. Since he was slow in running, he had to stay after school and also drop swimming to practice running. This was kept up until his web feet were badly worn and he was only average in swimming. But the average was acceptable in school, so nobody worried about that, except the duck.

MORE
C.(b)

The rabbit started at the top of the class in running, but had a nervous breakdown because of so much makeup work in swimming.

The squirrel was excellent in climbing until he developed frustration in the flying class where his teacher made him start from the ground-up instead of from the tree-top-down. He also developed charlie horses from over-exertion and then got C in climbing and D in running.

The eagle was a problem child and was disciplined severely. In the climbing class he beat all the others to the top of the tree, but insisted on using his own way to get there.

At the end of the year, an abnormal eel that could swim exceedingly well, and also run, climb, and fly a little had the highest average and was valedictorian.

The prairie dogs stayed out of school and fought the tax levy because the administration would not add digging and burrowing to the curriculum. They apprenticed their child to a badger and later joined the groundhogs and gophers to start a successful private school."

The moral of the fable is, of course, that people are different, and any attempt to fashion all in the same mold rather than capitalizing on individual strengths and potentialities COULD result in overall mediocrity. Individual talents could go unrecognized, untapped and undeveloped.

DISTRICT SUBMITS TITLE III APPLICATION

In accordance with procedures and guidelines established by the State and Federal Offices of Education, Mineola Public Schools has submitted a proposal for a grant to prepare a new instructional design in an integrated subject area. Titled "The Design, Development, and Implementation of a Learner-Centered Instructional System in Mathematics Integrated with Vocational Education," the proposal is part of a collective effort on the part of the 17 school districts in the ES '70 network to apply the systems approach to curriculum design and revision. Each of the participating schools in the network has selected sufficiently different subject areas so as to cover most of the secondary school [illegible]

The decision to consider Title I[illegible] possible avenue of funding was [illegible] national ES '70 Executive Committee [illegible] meetings in this District suggested [illegible] subject area to be considered and [illegible] decision rested in the hands of the high school ES '70 Steering Committee. This Committee endorsed the recommendation of a Mathematics-Vocational Integration and immediately the wheels began to turn to prepare the proposal which would eventually emerge as a 200 page document. As the ES '70 Coordinator, Mr. Spack, assumed the responsibility for drafting the proposal, and this involved consultations with personnel in Washington, Albany, and elsewhere. The completed application was mailed simultaneously to the State Education Department and the U.S. Office of Education, where it will be reviewed by both parties and considered for funding. Previous experience with such applications tells us not to expect any response on the proposal until April.

Although the subject area selected for Mineola involves mathematics and vocational areas the proposal prescribes a program which has immediate applicability to all subject areas. The format described follows the systems approach to curriculum revision and the procedures and guidelines indicated can be transferred to any field of [illegible]tion. For this reason it is recommended that all interested persons glance through the proposal to review the design strategy. If funding is granted this year we may wish to consider additional applications in other subject areas or possible local development using our own resources. Copies of the proposal have been circulated to members of the ES '70 Steering Committee and are also available in the Mathematics, Vocational and Business Departments. Reaction to the document will be greatly appreciated especially in light of revision and design of future applications. Any comments either in writing or through verbal communication will be graciously received by Mr. Spack.

MORE

CONFERENCE DAY TO HIGHLIGHT NATIONAL FIGURES

Present plans for the February 23 Conference Day include the visit of two nationally recognized personalities in the field of education. The morning session will feature an address by Dr. Bertram Spector, Vice-President of Research for the New York Institute of Technology, on a topic related to the future of American education. New York Tech. has earned an outstanding world-wide reputation for its pioneering spirit in the areas of systems design and computer technology. Identified by the U.S. Office of Education as one of the leading institutions in the country in terms of its innovative concepts and applications, this neighboring institution of higher learning has been extremely cordial to Mineola Public Schools by offering to share many of its programs and techniques for our own students' use. In light of our involvement in ES '70, Dr. Spector's remarks will have great significance to Mineola High School.

The afternoon session will highlight the presence of Dr. Thorwald Esbensen, Assistant Superintendent of Schools in Duluth, Minnesota. Dr. Esbensen, who has kindly consented to spend the day with the Mineola faculty, is responsible for implementing a fascinating program of individualized instruction in his own school district. Several members of the District's administrative staff, faculty, and Board of Education have visited the Duluth Public Schools and all have returned enthused and eager to consider a similar program of operation for our District. Dr. Esbensen will discuss his program and explain the implications it might have for us in Mineola.

Indeed, with two such reputable personalities speaking on topics of vital interest, it is expected that the February Conference Day will inspire serious thought and stimulation for our own program of development.

LIBRARY SHELF ON ES '70

At the request of many faculty members seeking information about individualized instruction, the systems approach, educational technology, behavioral objectives, the learning process, a special shelf in the professional materials section has been set aside for such publications. The shelf is located in the back room of the library and those wishing to check out books may do so through Mrs. Levy or Mrs. Malino. An attempt will be made to update the collection as new materials are available. Teachers who wish to make recommendations for book purchases or periodical subscriptions in areas related to ES '70, are asked to contact Mr. Spack. Attention is also directed to interested faculty members to the District Professional Library at 200 Emory Road. Collections there include many educational journals and books of interest in the field of general education and specific departmental areas of specialization.

RESEARCH ON FOREIGN-BORN STUDENTS

At the last meeting of the ES '70 Steering Committee, Mr. Weston reported on some preliminary research he has conducted with reference to our foreign-born students.

A report of his findings and observations is included below for your interest and reaction.

A recently completed research project conducted in the Mineola High School revealed some interesting facts about District 10 secondary school children who were born in foreign countries. Of about 60 such children in the high school, 19 were born in Portugal, 14 in Italy, and about 10 more are Spanish-speaking. In the homes of 60% of these children, NO English is spoken. In the homes of the other 40%, English is used among the children in the family but not with the parents.

These children endure a disadvantage which is quite evident. Their own lack of facility with the English language and certain "value" differences between them and their classmates, contribute to the creation of alien beings in the conventional classroom. Standard guidance techniques may not always apply. Testing is

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impossible because any test is first, for them, an English language test. (These children fail over half of the Certifying and Regents final examinations.) Communication with their families is very difficult.

It is also interesting to note that more than half of these children are older by one and two years than classmates in the same grade.

The major problems encountered in implementing a program of education for these children are the identification of goals for these youngsters and the programming of educational experiences to help them realize their maximum potentials in our society.

Undoubtedly, many other students are frustrated in their educational endeavors because of a variety of types of disadvantages, and a system of education designed for foreign language-speaking children may be applicable to them also.

What is probably needed first is a concept of educational management designed to direct the learning experiences of such disadvantaged students. We would appreciate hearing about ideas, comments or questions that you may have regarding these problems.

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Dr. Ben Wallace, Superintendent of Schools.

Mr. Eliot G. Spack, ES '70 Project Coordinator.

NEWSLETTER

VOL. II NO. 1 MINEOLA PUBLIC SCHOOLS NOVEMBER 1968

STEERING COMMITTEE ESTABLISHED

In response to the faculty survey conducted several weeks ago, fifteen faculty members have been invited to serve on the high school ES'70 Steering Committee. The committee will meet monthly to monitor the school's progress in the ES '70 program. The members of the committee are:

Mr. Joseph L. Besosa
Mr. John Connolly
Mr. Fred Craden
Mr. Merrill Debski
Mrs. Rhoda Fishkin
Mr. Donald Holquist
Mr. Donald Johnson
Mr. Eric Knuffke
Mr. Vito Merola
Mr. Martin Mishket
Mr. James Mullen
Mr. Robert Nadel
Mrs. Joyce O'Brien
Mr. Anthony Valeri
Mr. Jess Weston
Dr. Ben Wallace
Dr. John L. Sullivan
Mr. Robert Dever
Mr. Alfred Schutte
Miss Betty Smith
Mr. Eliot Spack

FACULTY TEAM VISITS BLOOMFIELD HILLS

Four members of the faculty were designated to visit the schools of Bloomfield Hills, Michigan. John Connolly, Joan Berbrich, Don Johnson, and Don LaMontagne were asked to spend two days in thorough examination of the continuous progress curriculum program which has been operational in this district for two years. The program features individualized approaches to all subject areas across all grades in three selected demonstration schools. Upon their return to Mineola we will look forward to a report from our team of visitors to apprise us of their findings.

LIBRARY SHELF ON ES '70

The special shelf set aside in the library for ES'70 materials has been augmented by the following additions:

Bloom, Taxonomy of Educational Objectives: Cognitive Domain
Kathwohl et al, Taxonomy of Educational Objectives: Affective Domain
Mager, Developing Attitude Toward Learning
Sanders, Classroom Questions: What Kinds?

Multiple copies of these books are in the library and faculty members are invited to review them.

TEACHERS TEST INDIVIDUALIZED APPROACHES

Observers to the classrooms of Rhoda Fishkin and Merrill Debski have recently witnessed students operating in individualized programs. Mrs. Fishkin's students have been working on a ten-week unit in the humanities using a contract method. Mr. Debski's students in Music Theory have been utilizing the programmed series, Music 200, in conjunction with records and topics which allow them to proceed at their own pace. In a later newsletter we will have a more expanded report on these activities.

TITLE III PROJECT RECEIVES SUPPLEMENTAL GRANT

The original grant to District No. 10 to develop a learner centered instructional program in mathematics integrated with vocational education has been supplemented by an additional allocation to assist in product evaluation. Project director, Don Holquist reports that this additional grant will be applied to contract the services of the Educational Products Information Exchange (EPIE), to review all available mathematics materials in relation to previously specified objectives. The objectives will have been produced as a result of the efforts of the Title III project staff: Dave Poole, Jim Mullen, Wally Kravitz and John Irving. As progress develops in this project the faculty will receive regular reports.

SAMPLES OF INDIVIDUALIZED MATERIALS

Several weeks ago materials were circulated to all department chairmen reflecting varied approaches to individualized instruction. All teachers are invited to review these materials as they become available. If additional examples will be useful, Mr. Spack will make every effort to secure them. Please contact him if you desire to review instructional materials which are not in the packets.

SELF-INSTRUCTIONAL MATERIALS FORTHCOMING

Many teachers have inquired about the possibility of another in-service program on behavioral objectives similar to the one held last spring with Dr. Esin Kaya. The District is awaiting the arrival of a validated set of self-instructional materials on this subject which can be used by all interested faculty members on an individually-paced basis. As these materials become available you will be advised of the arrangements for their utilization. We do expect these materials very shortly.

QUOTEWORTHY

"During the Seventies we will continue to be concerned with the organizational innovations, refining them and learning how to manage them more efficiently.

"But I believe we are going to see a shift of emphasis in innovation--from a concern with organization to a concern with building new teacher, student, and administrator roles which the organizational innovations now make possible.

"And we are going to be concerned about making progress towards some of the goals in education which we have given lip service to in the past but have made little progress

towards achieving. We will become more concerned than we have been about humanizing the school--making it the kind of place where pupils can grow in their sensitivity to one another, to beauty, to themselves, and to real problems which confront them--the kind of place where creative teachers and pupils are safe; not threatened, coerced, and ground up by the system--where creative people can think divergently and engage in imaginative analysis, and imaginative synthesis.

"I would hope that the 1970's will bring new methods for fostering self-directiveness--ways to teach students to be self-diagnosing, self-prescribing, self-motivating, and self-evaluating individuals.

"And I hope that new emphases will be placed on the teaching of critical and analytical thinking, especially as this kind of thinking takes place in the setting of the discussion class, and rational decision making, which is the process of linking decision making, through logic, to a knowledge base."

--Eugene Howard, Institute for
Development of Educational Activities
Extracted from Phi Delta Kappan, October 1968

UNION FREE SCHOOL DISTRICT NO. 10
MINEOLA PUBLIC SCHOOLS
MINEOLA HIGH SCHOOL

Dr. Ben Wallace, Superintendent of Schools
Dr. John L. Sullivan, High School Principal
Mr. Eliot G. Spack, ES '70 Coordinator

NARRATIVE TO ACCOMPANY PRELIMINARY PERT

March, 1968

The attached diagram employs a very gross attempt to use the analytical management technique of PERT (Program Evaluation and Review Technique) to schematically indicate our projected direction.

The use of PERT, based upon network planning theory, has proven extremely valuable in large-scale systems development projects involving a multiplicity of programs, innovative techniques, research and development aspects, complex resource and logistic problems - all of which must be integrated, coordinated and controlled. The use of such techniques, however, for a complex project in a social area like education is quite unique, although urgently required.

The uniqueness in using such a tool for a project like ES '70 arises from the fact that, although the end objectives and the major programmatic thrusts are generally known, the overall program is in a systems definition stage. It is anticipated that there will be a somewhat uneven development toward definition of highly specific objectives in each program, identification of detailed responsibility, breakdown of major programs to measurable units for detailed scheduling, resource and cost assignments, and a full definition of interrelationships and dependencies. As such definitions take place, the usefulness of PERT in performing the working, management-monitoring task will continue to grow.

The activities represented on this chart have been plotted along three main axes. These axes represent three main functions which must be fulfilled in reaching the project objectives. They are:

1. Staff development
2. Instructional management
3. School management

The activities along these three axes must be closely coordinated. For example, it is necessary to have the staff properly trained to have the necessary facilities installed and the modules developed before they can be tested.

As one looks at the chart, the upper axis reflects a projection for staff development. Notice that the initial stages are basically clerical - analyzing faculty survey data, analyzing staff functions, etc. Also note continuing lines at both the top and bottom of this category which suggest on-going activities which are continuous to this entire time period. The action phases of staff development are noted after the establishment of the steering committee with the conduct of studies, design of programs and beginning of in-service training. It must be pointed out that several activities will be occurring simultaneously and, as such, there is no real dependence of

one upon another at this stage. As indicated, the major emphasis of this axis results in programs of in-service, initially to selected staff and ultimately to a larger group. Note also that the final stage indicated calls for an evaluation of the entire program.

The second axis bears the label of instructional management. For reference purposes only, an attempt has been made to suggest a review of operational programs in Mineola High School. The list is by no means definitive and no suggestion of priority or emphasis is intended. What is intended is to examine operative programs in light of our ES '70 direction. This can be observed by a partial and non-comprehensive list of some new programs which may emerge as a result of our efforts. It must be noted that some projects evolved as a by-product of discussions held recently and others emerged naturally with no direct linkage to the new school improvement program. They are listed solely for reference and, again, without any consideration of priority.

The balance of this axis identifies two simultaneous activities. First, using the new programs listed, the diagram plots out a type of systems approach to the development of new curricula. Note: the initial stage of specifying performance objectives followed by related phases we have discussed elsewhere. Secondly, if you examine the center line you will note a path related to "Defining Educational Objectives." This most vital task seeks to prescribe a course of action unrelated to subject matter. It requires us to cooperate in defining the goals (objectives) of the high school experience. Only when this challenging undertaking has been completed can we begin to talk seriously about breaking down some of our traditional barriers in an attempt to integrate our curriculum.

The third major axis reflects a type of logistical emphasis which is equally important. For, indeed, it is not sufficient that we merely change the instructional program - commensurate adjustments must be made with regard to facilities and administration. This section outlines a series of considera tions that must be heeded if our three axes are to be kept in some type of synchronization. The upper three paths relate to the maintenance of vital liaison with the State Education Department, local universities, and the ES '70 network through an information exchange system. Other paths specif the design of new programs capitalizing on the availability of new high speed data processing and computerized systems. Note that here also there are built-in opportunities for monitoring and modifying - essential ingredients in the application of the systems approach.

A fourth axis at the bottom deals with community information and this line will be developed into a larger plan in the near future.

The schematic PERT which accompanies this narrative is by no means a final document. Hopefully its technique will serve to assist us all in plotting our course of action in the months and years ahead. Revision to the chart is expected and invited. For, as we collectively project our efforts we will have a greater awareness of our ultimate goal.

Eliot G. Spack
mw

DRAFT

DRAFT
March 6, 1968

A PROPOSAL TO CONDUCT IN-SERVICE TRAINING IN A PERFORMANCE-BASED CURRICULUM

Essential to the development of curriculum revision in Mineola High School is the necessity for thorough staff orientation to the new concepts fundamental to the new design. Previous revisions in curriculum have been limited to the development of new course outlines, study guides and presentations in new media. These exercises were in themselves, valuable contributions to the instructional program and many of these products continue to serve our needs today. For the most part, however, these activities focused their attention and direction on subject matter (content) mastery as being the primary product of student activity. Since this was consistant with the traditional role assumed by the classroom teacher little effort was needed to provide any type of training in the new techniques of curriculum writing.

Our present concern for the development of new materials to accommodate such techniques as "individualized" and "multi-media" instruction requires us to reexamine our direction and focus. It appears that a new line of sight is prescribed by the nature of the problem. The emphasis on an end product of subject matter digestion must be replaced by a new priority - that of pupil performance or behavior. The knowledge explosion has taught us many lessons - the most basic being that no human being can master the awesome augmenting amount of information that society is producing. To suggest that we can teach everything would be ludicrous - the best that we can do is to teach our students how to learn - to equip them with the skills that will enable them to be life-long learners

Now, if the previous assumptions are accepted as being valid then it is incumbent upon us to ask some key questions. First we must ask if, given this new focus and direction, can we achieve this desired outcome by using present methods and

materials? And second, if we presume a negative response to the first query, what modifications do we make in order to bring us closer to our new goal? The balance of this paper will outline a proposal to provide a very basic orientation to staff members who would like to participate in a study group/workshop geared to the development of a performance curriculum.

The participants would be volunteers from the high school faculty who would meet twice weekly for eight weeks before the end of the school year. Sessions will include presentations by outside consultants, group discussions and task force preparations by teams of teachers. Participation in the full program including the completion of assigned activities will result in the granting of in-service credits.

A major emphasis of the study group will be devoted to the preparation and specification of performance objectives. To assist in this task a consultant will guide the participants in the orientation to this fundamental technique and prepare the group to begin to write their own performance objectives. Once the orientation has been completed teachers will be assigned to task forces to prepare units of study on preselected topics. The teams will divide their responsibilities and individuals will prepare a series of objectives to be critiqued by the other members of his team and ultimately by the workshop leader. This rather limited experience should provide a sufficient introduction into the field so as to generate at least a beginning in the area of specifying performance objectives.

Further sessions will be held to outline some other vital ingredients to the process. Orientation on a limited scale will be provided on the topic of developing instructional strategies - the question of how to match up resources and learning activities with the pre-stated performance objectives. Although this requires a course in itself the group's exposure to this topic will have to be limited to the explanation of multi-media

approaches, survey of resources and the area of diagnosis and prescription.

A series of concluding sessions will bring to the group a consultant in the field of assessment - a testing specialist who can provide training and supervision in the art of constructing performance criteria. For, as essential is the need to specify the desired performances (or outcomes), an equal priority must be extended to the task of measuring the degree to which that performance has been attained. To specify the objective is not the sole answer - both the student and the teacher must be able to assess whether or not the intended goal was achieved.

The consultant will work with the group as a whole and then through the teams as the teachers begin to construct performance criteria for their previously specified objectives. In this way it is hoped that the participants will see the merit of thinking in performance (rather than in content) terms.

The by-products of this super concentrated program should prove quite valuable to the high school program. Initially, the study group/workshop should produce a cadre of teachers who can serve as potential team leaders in writing performance objectives within their own curricular areas. Secondly, this session may serve as a launching pad for a more extensive curriculum revision within the high school - one which may very well involve an integration of several subject areas within the school program. Thirdly, the program may provide the spark to other members of the faculty to give consideration to this new approach as an alternative to other accepted methods and finally, the individual projects of the teams themselves may very well be carried over into the classroom for trial and revision under field conditions.

I think it only fair to point out that talking alone can never produce results. The true test of any hypothesis is in its application. In this proposal lies our empirical vehicle to the launching pad.

EGS:fb

IN-SERVICE - QUESTIONS

Preparatory to the development of a complete program of training an attempt was made to identify the key questions which need responses in the course of the in-service program. These questions are reproduced here for background purposes.

A. Nature of learning

1. How does a student learn?

2. What factors contribute to the learning process?

3. What factors inhibit or deter the learning process?

B. Objectives and goals

1. What should be the educational goals of today's students?

2. What is the purpose of having a taxonomy of educational objectives?

3. What are the elements of such a taxonomy?

4. Why are we so concerned about behavioral (performance) objectives?

5. Are we saying that all of our educational objectives can be reduced to behavioral terms?

6. Are objectives structured according to subject matter or are they related to process goals? Just where does one start?

7. Once we specify our objectives who will validate them? students? other teachers? outside experts?

8. If we use subject matter as our point of departure can we sequence objectives in a hierarchical order for all subjects?

9. How do we know whether the students have accomplished the stated objectives? What assessment devices do we use?

C. The individual

1. Are objectives the same for all students?

2. Are performance criteria the same for all students?

3. Are learning strategies the same for all students?

4. What do we need to know about students in order to provide for individualization?

5. If diagnosis leads to prescription based upon student strengths what provision will be made for necessary remediation?

6. What role can achievement motivation studies play here?

D. Instructional activities

1. How does one decide what assignments are best for specified objectives?

2. Where does the computer and teaching machine fit in here?

3. What dictates which activity is to be used by which student?

4. How can we begin to integrate the curriculum?

EGS:fb

3-27-68

IN-SERVICE PREPARATION

As a result of his participation in this in-service program, the trainee will be able to:

A. Employ taxonomical skills

1. Define "taxonomy" as applied to educational goals.

2. Identify objectives expressed for the cognitive domain.

3. Identify objectives expressed for the affective domain.

4. Identify objectives expressed for the psychomotor domain.

5. Analyze subject matter in his own field and structure it hierarchically.

Materials:

Bloom: Taxonomy of Educational Objectives: Cognitive Domain

Krathwohl: Taxonomy of Educational Objectives: Affective Domain

Lindwall: Defining Educational Objectives

Vimcet: Filmstrip #1

B. Determine Objectives

1. Define behavioral objectives and list characteristics of behavioral objectives.

2. Distinguish between objectives which are behaviorally stated and those not so stated.

3. Write behavioral objectives which meet the following minimum standards:

a. Clearly present the teacher's intent in terms of what the student will be doing.

b. Defines minimum acceptance performance.

c. Defines the conditions under which the behavior or performance will occur.

d. Clearly states how the learner will be evaluated.

Above objectives will be written for own field for cognitive domain.

4. State how the objectives he has prepared are appropriate to·

   a. Societal needs.
   b. Developmental needs of the youth he will be teaching.
   c. Structure and methods of inquiry of the discipline from which the objectives are drawn.

5. Define performance criteria and write test items which adequately sample behavior described in previously prepared objectives.

   a. Submit objectives and criteria for external validation.

   b. Critique objectives and criteria prepared by other staff members.

6. Sequence objectives according to levels of dependence in some hierarchal structure.

Materials:

Mager: Preparing Instructional Objectives

Vimcet: Filmstrips, tapes

C. Develop Instructional Modules

1. Select appropriate and relevant instructional materials related to specified objectives.

2. Devise multi-approach learning activities leading to the accomplishment of his intent for the student and meeting the need and satisfying the interest of the student. Some suggested types of activities might be as follows·

   a. Writing
   b. Discussing
   c. Graphing
   d. Drawing
   e. Operating
   f. Outlining
   g. Designing
   h. Modeling
   i. Simulating
   j. Constructing

3. Devise a multi-media approach to information presenting, all leading to accomplishing the intent of the teacher's goal for student performance. These media must be varied to meet the needs and interests of the students. Some suggested media are as follows·

a. Audio tapes
b. Video tapes
c. Slides
d. Filmstrips
e. Transparencies
f. Motion pictures
g. Single concept loops
h. Textbooks
i. Lectures
j. Demonstrations

4. Write plans which place in appropriate sequence

   a. Anticipated pupil activity with pupil performance criteria

   b. Teacher actions

   c. Media

Materials:

Briggs, Campeau, Gagné, May: Instructional Media

Vimcet-Filmstrip/tape

D. Describe the nature of learning

1. Identify the role played by motivation, reward, punishment, and emotion, in the learning process.

2. Define the position that "learning is reacting."

3. Distinguish between transfer and formal discipline as the tool to the learning process.

4. Demonstrate an awareness of the inherent individual differences within students which require individual approaches to learning.

3-15-68
Revised
5-1-70

THE ELEMENTS OF AN ES '70 SCHOOL

To suggest that the world has experienced a rapid transformation in recent years would simply be a massive understatement. We must be concerned, however, not only with the rate and substance of change but also with their true import for public education. We must raise our sights on to the new horizons that have been created by the knowledge explosion of the past twenty years. We must recognize fundamentally that the role of the public school has changed and that corresponding changes in system and structure have to be made. The press for conformity and uniformity of outlook must be countered by an educational design that calls upon the development of individual autonomy and responsibility.

Such a design is the ES '70 Program which responds to the above needs in a most definitive way and, in addition, faces a further need expressed by educators across the nation. For several years the leaders of the nation's school districts have expressed their concern over the growing disparity between the traditional curricular offerings of secondary schools and the fast changing needs of large segments of the American population. It is the unanimous agreement of the ES '70 participants that a priority need exists for bridging the gap which exists between the academic, vocational and general education areas found in most school districts across the U.S. As the new curriculum design emerges it can be expected that the following characteristics will be evident:

The program will:

1. provide for an individualized instructional program for all students

    a. utilize a variety of instructional strategies to accommodate this approach

    b. employ a sophisticated activity of diagnosis and prescription

    c. develop a curriculum formulated upon behavioral objectives with accompanying statements of performance criteria

d. employ modular arrangements of instructional materials which permit the learner to study materials relevant to his career goals at a pace consonant with his ability.

2. be highly relevant to the adult roles which students will play

   a. cluster arrangements of vocational careers which enhance the opportunity for the learner to pursue a study pattern which will expand the choice of possible career patterns rather than limiting it to a specific trade or field will exist

   b. industrial, commercial, and higher education entry level skills will be provided in a way which will offer true options for the learner.

3. result in a merger of the academic and vocational aspects of the curriculum into a comprehensive program of education.

4. utilize appropriate educationally oriented technology

   a. proven technological and electronic devices and systems will be widely used as a necessary component of an individualized instructional program which is economically feasible.

   b. Machines will assist the learner to assimilate material at his own rate

   c. Computers which can serve large numbers of students will be increasingly involved as an integral part of the instructional program.

5. reguire a new emphasis on career orientation and counseling.

6. employ new systems of school organization and flexible scheduling patterns

   a. through computer utilization a system will allow program changes to be made to meet student needs on a quarterly, monthly, weekly, or even a daily basis.

   b. management decision-making will be enhanced due to the simulation possibilities of sophisticated data processing

   c. school facilities will provide fewer traditional learning spaces and more small group and individual study areas

7. develop new staffing patterns within the school and require new roles for professional and para-professional staff

   a. professionally trained teachers, certifiable in accordance with local and state laws and procedures will be the core of the instructional teams

b. professional personnel from the community who serve other social, governmental, and private agencies as well as business enterprises will be a major element of the instructional teams

c. non-professional personnel will become an increasingly evident component of the instructional team. As the professionals become more aware of ways to utilize the talents of the non-professionals a hierarchy of non-professional jobs from the teacher aide to the educational and technological assistant may well develop.

8. incorporate sophisticated information storage and retrieval systems to maintain current records for guidance and student information

9. require extensive in-service training and revised pre-service training

10. be economically practical within available public resources

11. incorporate provisions for frequent evaluations and modifications.

The design and implementation of such a system will not result in a rigid "structure". The very nature of the systems approach in its application to education will require frequent provisions for evaluation and revision. It is anticipated that the development of such a flexible educational program will respond to a serious need of our society in that we must serve youth so that they may learn to serve.

MINEOLA PUBLIC SCHOOLS

January 1968

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PROSPECTUS FOR CHANGE

INTRODUCTION

BY DR. BEN WALLACE

Every institution, at appropriate intervals, must look at its role in the scheme of things. Not only must it assess the efficiency of its mode of operation but the mode of operation itself. In addition to examining the quality of what is being done, it must study the question of whether what is being done is what should be done or whether the objectives to be accomplished would best be discharged in a different manner.

The broad field of public education has been indulging in intensive analysis for more than a decade. The process has developed from a posture which, in general, called for extensive increases in expenditures of funds to an internal examination of the components and processes within the field itself. There is no doubt that for many years public education was underfunded for what it was expected to do. Even today on a state level there is no viable plan to keep state support on a plane which recognizes the current costs. State financial planning is in a continual position of catching up.

More important, however, is the fact that increased expenditures are not enough: not that costs. In a continually expanding and inflationary economy are not going to increase, but gains to be made from simple commitments of additional funds under present structures, functions and procedures to achieve objectives necessary in the present world context, would be disproportionate to the investment. In addition, implementation of this philosophy would be doing a disservice through perpetuating a goal and procedural system which is ineffective.

To verify that the question is under investigation and a national concern, one needs only to look at the literature extant in the profession. In addition, the public media is glutted with evidence of concern at solutions. Entry of the federal government and foundations into the field is plainly evident.

What should be observed here as a significant factor concerning the structure and function of public education is that educational solutions to educational problems are being sought and implemented outside the traditional structure. One need only examine the details of operation of the various aspects of the Manpower Act, the Office of Economic Opportunity, the military and elements of the anti-poverty program to note this.

Public education cannot maintain its preeminence in the field of formal education without a careful examination of the context within which it exists, its objectives within that context and the modes and procedures employed to satisfy those objectives.

This paper reflects the assumption that such an examination is in progress on a national scale. It further takes note of the fact that the national context applies to the local situation. It is based on the position that the local program of education is a strong and viable one within the traditions of public education.

This prospectus proceeds from the position that within this tradition the local staff is of high quality and is providing a program of an equally high quality.

What the prospectus does question is the tradition itself.

Further, this paper is based on the principle that the local institution has the responsibility to exert initiative, leadership and energy to contribute to the solution of the problem. It cannot wait for the answer to be issued from a central authority.

This responsibility is shared by laymen and professional alike. Within the concept of individual responsibility in a democratic society, there is no exclusivity of burden. Concurrent and mutual study must ensue. Resources must be provided and changes must be recommended.

Finally, it is recognized that this paper is, at best, outline and summary in nature. It attempts to serve the function of a prospectus; to give advance information calculated to arouse interest and gain support.

CONTEXT

To say that the world has changed is trite. The world has always changed and will continue to do so. What is significant to note is the rate and the substance of change and to raise questions concerning their import for public education.

Within the past twenty-five years airplane speeds have increased for passenger travel from 150-200 miles per hour to 700 miles per hour. Contracts have just been let to develop the prototype for a 2000 miles per hour passenger jet. The aspect of mobility has a direct bearing upon education. It affects the resources becoming available to the local institution and the perspective from which to view what is to be studied. The problem of the distance away of a resource or area of study is becoming more easily resolved and is being removed from the nature of vacarious experience. Taking the pupil to, or bringing the resource from, a previously prohibitively distant point is fast becoming an acceptable fact. Busses, automobiles and walking field trips continue to make inroads in this area. With the airplane and helicopter the vantage point from which study takes place is subject to change. Resources are now at hand to permit pupils to study weather, topography and geography is actuality rather than from relief maps and pictures.

Demographic analyses show increasingly that not only are families in general changing residence but that the number of times an individual family changes its residence is increasing. Geography is no boundary.

The question raised here is in relation to curriculum. How does a pupil accommodate himself to change from one school district to another, from one section of the nation to another? For some, the answer is easily at hand: a national curriculum. If this means a standard body of content presented at a standard pace, it flies in the face of what we know about individuals and learning. If it means a common approach to methodology and process, this is a different matter.

Knowledge itself has changed dramatically. The scope and depth of what is known has mushroomed in the past quarter century. Not only has the substance accrued but the rate of accession and dissemination literally parallels the speed of light. Until World War II, the substance of knowledge changed at a very slow rate and in the field of public life caused little problem. Since then it is widely and minimally estimated the sum total of world knowledge has doubled in the past twenty years and will double again in the next seven years.

The rate of dissemination has also increased. The field of publication is not only efficient but prolific. The breadth of information thus available is staggering. In terms of knowing all that is known, the educated man is passe - an impossibility yesterday, a fantasy today.

What is announced as new knowledge in Japan at midday may be seen around the world in the fraction of a second. The heap and flood of humanity engaged in the development of history is not front page news to be abstractly and casually read. It is concurrently visible and audible. The face of the demagogue across the world involves the personality - emotions, fears, intelligence - of the television viewer in New York.

Since knowledge itself is a basis for behavior, these factors have serious implication. Its rate of change; its mass; its availability; the context of its accession by the individual all raise serious questions for public education.

The system by which individual value structures, if not the base itself, are effected has undergone significant change. David Reisman (The Lonely Crowd) posits a rationale for the development of a mode of attitudinal stance related to sociological and economic factors.

Agreement or disagreement with his position is not the point here. The point is acknowledgement by public educators that the motivations extant with the founding of the public school system, and much of its present structure and operation, have changed and that corresponding changes in the educational system need to be made.

The press for conformity and commonty of outlook must be countered by educational designs that call upon the development of individual autonomy and responsibility. The survival of the democratic state, with its emphasis on the dignity and worth of the individual and realization of individual potential, demands this.

The move toward garrison-type government in both the East and West hold serious portent if not actively and energetically countered. It does no good to state that centralism in the East moves from military toward a civil garrison; it is more serious to note that the West moves from the civil toward the military.

Reisman's concept of the autonomous man who uses individual resource and knowledge in determining when to conform and when to dissent is a rational point from which to examine the base value system which should undergird and motivate the structures of public education.

Technology has much to say to people concerned with education. The complete reorientation from mechanical to electronic energy results in entirely new forces being brought into play. The same stance addressed to mechanization cannot be adopted in electronics. Speed, storage and retrieval and independence of process demand change.

The multiplication of the impact is astronomical. The economic and sociological import is illustrated in technological unemployment, the increase in leisure time and the mass media. The productive force of the

economy is difficult to imagine. Suffice to say that a complete reversal in personnel requirements is taking place - both quantitative and qualitative. It has been estimated by respected authorities that in the immediate future, ninety per cent of the population will be supplied by the productive efforts of ten percent of the population.

The emergence of new nations and the forces generating them, so akin to our own national development, give educators cause for concern. The impact of the behavior of these nations, in manner and substance nominally in contrast to our own national designs, more often than not causes reaction based upon ignorance, prejudice and shallowness of intellectual resource. All of these are basic concerns of educators.

The earth will surely get no larger and the proximity of cultures will cause increase, much less decrease, in the frequency of need for the individual to react. The concern of the educator is that the individual be capable of reacting from a position of individual responsibility and intellect as opposed to mere accommodation of the doctrine and dogma issuing from governmental or associational authorities.

Finally, a half century of psychological and sociological research needs to be accommodated. It is clearly noted, and has been noted for a quarter century or more, that most of our curricular organization and instructional processes fly in the face of psychological evidence. The reliance of educators on disapproval, as opposed to approval, as a motivating force is a prime case in point. The continued employment of instructional methodology that ignores the import of personal involvement and commitment by pupils is another. The nature of intelligence and its relation to curriculum and instruction, the importance of physical and psycho-social aspects of personality are others.

Again, this contextual statement is over simplified and not all inclusive in depth and scope. It must be viewed as the signpost which is designed to cause the observer to take appropriate action.

OBJECTIVES, ORGANIZATION AND METHODOLOGY

The organization of public schools, if it is to be viable and responsive, must reflect the objectives to be served within a given context and permit the implementation of a methodology consistent with both.

The paramount factor to be investigated represents the task to be done, the goal to be reached or objectives to be accomplished. In private industry, this deals with production, sales and profit levels. In medical circles it deals with recoveries, disease controls, and preventive public health activities. Education deals with matters of the preparation of the young through the efforts of a state social agency to assume an adult role in society.

An examination of historical literature dealing with American education reveals various statements ranging from "learning to read and interpret the Bible" to so-called "Life Adjustment" education. Various commissions from time to time have rendered impressive lists ranging from factors dealing with vocational education to college preparatory work. It is probably with the latter that the greatest efforts have been expended in terms of national commitment. The utilitarian view has long held preeminence in our operation and thinking. Direct and immediate transfer have regularly been in the scale balance as significant elements in judgement.

A great deal of discussion and polemic has taken place over the past forty years concerning individual attention, instruction, and learning. Prior reference has been made to Reisman's concept of autonomous man. It is suggested that within the present context, and that which is discernible in the future, the overriding and prime objective to be considered should be the production of an independent learner. This pre-supposes full range to

individual initiative and capability and recognizes the individual nature of learning styles and rates. It also accepts the fact that different rates and styles require different techniques and approaches in dealing with them. It presupposes a wide range in diversity of areas within a structured school program for the academic, vocational artistic, physical and social development of the individual. Further, it recognizes that, while learning is individual in nature, the results of developmental activity derive a great deal of their relevance for the individual in the social milieu. Also, this point of view is consistent with the idea that in determining the relevance of the results of activity by the individual himself, third and fourth party participation is vital.

Schools as now organized cannot achieve this objective. Essentially present modes of operation proceed in orientation from groups to individuals: Groups of relatively uniform size meeting for uniform time periods within rooms of uniform size. Subject matter and activities are uniform. The individual growth process is lost in the group and by the nature of statistics a built-in failure ratio is inevitable. The whole structure militates against individual growth and development. Until the poles of emphasis are reversed and the organization reflects the objective of individual growth and development, the operation of the public school is predetermined realistically at a level of significant failure.

The standard class size of 25 - 1 must be challenged. The uniform 5 1/2 - 6 hour day must be examined. The 10 month school year, the forty minute period, the 600 - 800 square foot classroom, all must be carefully scrutinized.

The methodology employed in the schools also is open to severe question. Although we spend significant amounts of energy to provide nominally for individual differences and individual attention, we continue

to be group oriented. The role of the teacher is continually thought of in a 25 - 1 basis and the instructional methodology resulting is the same.

To deal with individual differences the role of the teacher should be described in terms of:

Assessment	Taking stock of the levels of individual development:
Diagnosis	Ascertaining the strengths and weaknesses in the individual and readiness for future activity:
Prescription	The delineation of activities to extend strengths, buttress weaknesses and to raise the level of readiness; and process-information proficiency:
Integration	Aiding the individual to establish the personal relevance of which he has been doing and the significance of what he is about to do: as well as cognitive transfer:
Follow-Up	The observation of the activities of the individual leading toward the repetition of this cycle.

Needless to say, this demands considerable study of the training of teachers. This description involves the teacher as the manager of the total learning environment and is incongruent with the forty minute period, 8 periods per day, 5 times per week, 40 weeks for the year concept of tradition. It is inappropriate to the 8 preparation per day organization and calls for careful examination of current teacher load values.

It also calls for the creation of new roles and their appropriate assignment in the structure. The nomenclature which follows is arbitrary and is primarily for discussion purposes. Briefly these new roles include:

Learning Specialist — An expert in growth and development as it relates particularly to the interactive processes and learning; expertness in identifying individual characteristics which enhance and/or inhibit the learning process; the identification of learning style and the learningship of this to the processes of individual action.

Knowledge Specialist (Information) — An expert in subject matter; greater emphasis on the structure and method of content and the interactive processes; no relationship between competency and present teacher certification requirements; creates and/or constructs instructional alternatives.

Instructional Assistant — A person whose function is in expediting materials and situational arrangements for utilization and involvement of pupils; an expediter of operations.

Materials Technician — A person whose function is the preparation of instructional materials (films, slides, filmstrips, audio tapes, overlays, transparencies, and various combinations of these);

Further investigation will indicate the ratio of individual positions per specified number of pupils. It is anticipated that this would vary with the particular phase of the program.

In addition careful attention needs to be given to the role of such personnel as guidance counselors, psychologists, speech and hearing teachers, reading consultants, and nurses as they relate to the process.

Important, also, the role of the student teacher needs to be analyzed to insure proper utilization of time and the provision of proper field experience.

At the present time the role of the teacher is involved with the dissemination of information and the structuring and administration of tests which purport to measure the achievement of the individual in terms of an unidentifiable arbitrary standard of performance.

Little of the efforts of the teacher deal with the structuring of individual and independent learning. Surely, some reference is made to activities such as individual reports and research or projects of an individual nature. In the main, however, the syndrome is introduction, homework, recitation and test.

No great attention is paid to the innate characteristics of the learner. If he deviates too much from the norm of the group, he is assigned to another group made up of pupils with similar characteristics where the pattern is the same.

Subject matter and the broad content of school experience are organized against the same background: So much material to be covered in a given amount of time, usually ten months or a semester.

The individual elements of the subject matter are not analyzed nor is there any attempt to determine the significance of the mode of presentation. Little attention is paid to individualizing the elements of educational experience.

At the New York Institute of Technology a physics course has been elementally analyzed to reflect the significance of its components. The information is classified as to:

Concept
Skill
Law
Theory
Postulate
Fact

The import of these to the whole schema of subject matter is thus evident.

In addition, the mode of involvement of the learner is subject to analysis. (see physics presentation scheme.)

Thus, this is open for concern as to appropriateness of style and rate for the individual.

The methodology of the learner is significant, also. The modes of accession or participation in acculturation or learning must be transferable. The theory of transfer calls for identity of content or identity of method. As with instruction the method should change with content and the participation of the learner should develop patterns applicable to independent activity.

At present, as indicated before, pupil participation is teacher centered; with in most cases the teacher present or directly controlling the activities of the pupil. Recent trials in the use of programmed instruction in the Junior High School ran afoul of pupil, parent and teacher criticism because the interaction was solely between pupil and subject matter. All fell prey to the fear and concern that since the teacher wasn't teaching, the pupil wasn't learning. What was lost was the fact that pupils did as well interacting alone as was done in the traditional sense.

Tolerances must be established to recognize the stage of development readiness of the individual pupil to engage in a given activity or in activity related to a particular subject both in terms of the innate capacities of the pupil and in the psycho-social or motivational field. The traditional emphasis on extrinsic motivational devices should be mitigated through taking cognizance of the impact of the device or force on the nature of the individual. Attention is called to Percival Symonds' monograph "What Education Has to Learn from Psychology". Also, social psychologists have much evidence to indicate that external factors are not as powerful effectors as personal and internal involvement of the individual. The famous Westinghouse Hawthorne experiment is noted here. The true significance here is that personal involvement made the difference not that the "halo effect" destroyed the reliability of the results. The problem becomes not how can we destroy the halo effect but how can we maintain personal involvement.

In discussing organization and methodology, attention must also be given to phases of these two factors which are now looked upon as "resources" but must be brought into more direct play in the structure of education. These include such things as:

Audio Tapes
Records
Slides and Filmstrips
Films
Field Trips (individual)
Radio
Educational Television
Instructional Television
Seminars
Lectures
Museums
Libraries
Visiting Scholars
Interviews
Computers
Programmed Materials
Textbooks
Laboratories

An extensive commentary on these individually is not appropriate here. The closer we examine the question of independent activity in learning and consider the change in the roles of professional and non-professional personnel, the more significant and apparent is the need to redefine the nature of the deployment of the above listed elements.

The historical relationship between objective and method on the part of great institutions and teachers of history is indicated in the attached abstract from Broudy's essay "Historic Exemplars of Teaching Method."

CONCLUSION

What has been attempted here is an indication of a need for dramatic change in public education and some of the elements of the world which demand change. Also, in more or less general terms, the direction toward which movement is necessary has been indicated.

In considering the foregoing, it must be recalled that within the scope of the operation of the school district as traditionally conceived an outstanding, high quality job is being done. But in this, as in other school districts, the maxima that are attainable under present organization and methodology are not sufficient to the world of today much less that of tomorrow.

The solution lies in hard work, imaginative thinking and wise decision making. The solution lies not in vast increases in funds but in creative and responsive re-allocation of our resources to the task at hand. Distinctive expenditures of relatively modest amounts of funds coupled with incisive and decisive activity is sufficient.

The need for careful and thoughtful study cannot be used as the rationale for inaction. Careful and thoughtful study are part of the continuum of action that leads to solution.

Spring 1966-67
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MINEOLA PUBLIC SCHOOLS
MINEOLA, NEW YORK

LEARNER-CENTERED MATHEMATICS

DESCRIPTIVE PACKET

Designing Learner-Centered Instructional Systems
(Learner-Centered, Mathematics-Vocational Project-LCMV)
8 January 1971

These materials are produced through the use of federal funds awarded to Mineola Public Schools for Project No. (SED)748, USOE Grant No. OEG-0-8-061410-4569(055).

LEARNER-CENTERED MATHEMATICS

MINEOLA, NEW YORK

LEARNER-CENTERED MATHEMATICS PROJECT

MINEOLA, NEW YORK

The Learner-Centered Mathematics Project represents an effort to individualize secondary mathematics instruction in Mineola Public Schools, Mineola, New York.

DEFINITION

As for a definition, we mean that instruction is individualized to the extent that it is learner-centered and student progress is continuous. Instruction is learner-centered to the extent that the learner bears the responsibility for achieving and for making decisions necessary for achievement, i.e., setting goals, setting pace, selecting materials, when to be tested, and with whom to work. Instruction progress is continuous to the extent that the learner is free to move at a pace independent of other individuals, the group, the teacher, the clock, and the calendar.

Such a situation could have students in a classroom each working on different parts of the curriculum, using different materials, and taking tests when they are ready regardless of whether others are ready.

WHY INDIVIDUALIZE?

The reasons for wanting to individualize include the desire to meet individual needs and increase flexibility to avoid many problems inherent in group instruction.

To meet individual needs involves the provision of a flexible program content-wise, alternate instructional strategies, a wide variety of materials, an ability to diagnose learning and knowledge deficiencies, an evaluation scheme that does not rely on group norms, and procedures that permit the

interplay and management of all the various aspects of such a system.

Examples of advantages gained through flexibility include the avoidance of artificial grouping arrangements, elimination of a need for placement, more efficient use of student time (e.g. after late entry or absence) and replacement of study halls with irregular schedule arrangements.

THE PROPOSAL TO USOE

To bring about these changes Mineola Public Schools proposed to the United States Office of Education in December, 1967, the design, development, and implementation of such a learner-centered, continuous-progress instructional system for grades 9 - 12. The proposal was accepted and funded by USOE, and work began in July, 1968. Since then the goal was altered to include grades 7 - 12. By the 70-71 school year, the project has progressed to a point at which the entire seventh grade, half the eighth grade, eighty-four ninth graders and forty-two tenth graders are receiving individualized mathematics instruction from nine different teachers. Student-teacher ratios are in the range found with traditional classes.

The proposal called for the incorporation of academic, occupational, and general mathematics requirements in a single system. This required the analysis of the mathematical needs of three occupational areas (important to Mineola students), electronics, business, and mobile engines. These needs, together with academic and general mathematics requirements, had to be expressed in terms of student learning objectives. These performance objectives had to be observable and measurable, and were arranged in a series of units that

were mathematically and instructionally reasonable. Strategies for instruction had to be developed permitting individualization with respect to goals, instructional objectives, learning strategies, depth, and rate.

The intent was to preserve student educational and career options by avoiding the necessity for program decisions early in high school. The hope was to develop self-reliance and learning process skills so that the student can continue his mathematics education after leaving public school.

PROJECT OBJECTIVES

The original proposal listed three project objectives. The reference to the "ES-70 cooperating network" is to an association between 16 scattered school districts located coast-to-coast. ES-70 was originally started in the spring of 1967 at the instigation of the United States Office of Education to serve as a staging area for the re-design of the high school educational program. "ES-70" stands for "An Education System for the 70's". It is now a private corporation sustained by the participating districts. The project objectives are:

A. To design, develop, implement, evaluate and revise as necessary an individualized, learner-centered, "instructional system" in a Mathematics-Vocational Integration which is demonstrably superior to traditional modes of instruction. The system will:
   - be based on specific, measurable performance objectives.
   - make maximum use of "off the shelf" existing materials, media, etc.
   - provide for individual student differences in "learning modes".

- use in-the-classroom student performance as the basis for material/strategy revisions

b. To use the LS '70 cooperating network, developing different curriculum areas in each school and exchanging products both as part of an evaluation process and as an operational program; hence, using the LS '70 Network as a springboard for dissemination of the program products.

C. To develop a nucleus staff, well grounded in (1) the basics of the application of a systems approach to the design of instructional systems, (2) the development of behavioral objectives, (3) the requirements for reliable performance instruments and (4) the implementation of individualized learner-centered instruction.

LEARNING MATERIALS

Many different sources are available to students and a variety of senses can be used in the learning experience as a result. For the student who reads well, textbooks and programed instruction are included. Film loops and film strips are used although to a lesser extent. Audio tapes, workbooks, machine instructions, games, calculators, and other manipulative devices have been incorporated wherever they have been available and suitable. Locally produced audiotapes and worksheets have been developed to cover gaps and improve effectiveness.

MATCHING MATERIALS AND INSTRUCTIONAL OBJECTIVES

For each objective a Source and Activity Sheet is available which provides the learner with a statement of the objective, a criterion statement (usually a fraction), any necessary definitions, sample test questions, a list of specific sources in which can be found pertinent information and explanation,

and a list of activities each providing practice and reinforcement before going on.

These Sources and Activity Sheets are arranged into packets by the unit and the packets are available in ring binders in the classrooms. Answers to activities are also contained in the packets for the use of the student so that he can evaluate his own work.

UNIT SEQUENCE (see attached)

This list of unit titles describes the mathematical content in a general way. The first thirty-eight units make up the seventh and eighth grade program. Then follows algebra and geometry, and interspersed along the way are a variety of optional units. See the course requirements for a specific breakdown.

The numbers in square brackets after each unit title are the numbers of objectives in the various units.

LCM COURSE REQUIREMENTS (see attached)

Students receive credit for a course at a point in time when they complete the requirements as listed. No time requirement is made; however, several sample paces are described for guidance purposes.

TESTING

There are three quizzes prepared for each objective, and three tests prepared for each unit. This permits recycling on objectives and the use of tests for diagnosis and evaluation, while minimizing the incidence of cheating

GRADING

Grading consists of evaluating each quiz and test on a percentage basis, and then averaging the unit test results

[illegible] grade for that unit to compute the unit grade. Each quarter these unit grades are averaged to determine a quarterly mark. If no unit is completed during a quarter, the quarterly grade is incomplete until a unit is completed. The year's average is the average of the unit grades completed during the year and may differ from a course grade which is the average of the unit grades for the units making up that course.

These various grades should not be confused with the performance criteria which relate to specific objectives. For example, a given objective may have a criterion of 3 out of 3, 2 out of 3, or 8 out of 10, or whatever. This describes the performance generally expected on the objective quiz as a student procedes objective to objective. Of course, there is room for flexibility if the teacher so chooses.

PROGRESS CARD (see attached)

This card provides one means by which a learner's progress is monitored by the teacher, and communication occurs between learner, teacher, and teacher-aide.

A record of student performance must be maintained fairly easily because ready answers to many questions are useful: What is the learner's attendance record? On what unit is the learner working? What objectives has he accomplished in that unit? How long has he worked on them? How is his test performance? Does he perform well on first cycle quizzes; how frequently has he recycled? At what rate is he proceeding through the course work? How long has he been on the unit?

When the teacher looks at the cards of a set of students all which record performance on the same unit, patterns of success or difficulty may appear which have implications for the instructional and evaluative materials for that unit.

In a quiet, efficient way the teacher can use the card to communicate to the student the objectives to be worked on, and the objectives to be skipped, as a result of his unit pretest results. Homework assignments tailored to a student's needs can be communicated and recorded. Test results and unit grades are recorded and communicated. Objectives on which a student will be permitted to not take a quiz can be noted.

The teacher-aide looks at a card handed to her by a student, and without oral communication, will immediately know what quiz or test to give the student while avoiding a quiz or test already used by the student as noted briefly on the card. The teacher-aide can look at the set of cards belonging to students taking quizzes or tests and know how many and which papers are out.

When the unit is completed, the card can be used to record all grades, what objectives have been achieved, and the amount of time used. The data can be accumulated throughout the year by forwarding it each time to the next card, and the used card inserted into the learner's personal folder which is maintained in the room.

LCM STUDENT ACTIVITY FLOWCHART (see attached)
This flowchart describes the interplay of learner,

teacher, teacher-aide, the instructional sources, and the procedures. It demonstrates the learning and testing procedures that enable classroom management.

1/8/71 jba

UNIT SEQUENCE

1. Addition of Whole Numbers [16]
2. Subtraction of Whole Numbers [7]
3. Multiplication of Whole Numbers [12]
4. Division of Whole Numbers [15]
5. Sets [17]
6. Decimal Numeration [10]
7. Base 2 and 5 Numeration [13]
8. Other Numeration Systems [8]
9. Properties of Numbers [10]
10. Primes and Composites [6]
11. Integers I [10]
12. Fractions [17]
13. Operating with Fractions [12]
14. Basic Units of Measure [10]
15. Decimals [11]
16. Operating with Decimals [13]
17. Ratio and Proportion [5]
18. Percents [14]
19. Problem Solving with Percent [6]
20. Point-Sets [10]
21. Measuring [8]
22. Some Objects of Geometry [10]
23. Area [8]
24. Mathematical Systems [6]
25. Introduction to Probability [5]
26. Introduction to Statistics [12]
27. Integers II [11]
28. Rational Number System [11]
29. Exponents I [9]
30. Scientific Notation [7]
31. Squares and Square Roots [6]
32. Pythagorean Property [7]
33. Real Number System [12]
34. Precision and Accuracy [7]
35. Coordinate Geometry [8]
36. Geometric Relations [11]
37. The Metric System of Linear Measure [8]
38. Lateral Surface and Volume [7]

UNIT SEQUENCE (continued)

39. Flowcharts and the Use of the Calculator [15]
40. Manual Operation of the Programma 101 [16]
41. Programmed Operation of the Programma 101 [ ]
42. Applied Graphs [6]
43. Business Tables [16]
44. Algebra Language [9]
45. Monomials [8]
46. Operations with Rationals I [7]
47. Operations with Rationals II [6]
48. Open Sentences - Equations [17]
49. Open Sentences - Inequalities [11]
50. Exponents [7]
51. Radicals [12]
52. Sets of Numbers and Their Properties [8]
53. Finite Systems [3]
54. Verbal Problems [12]
55. Quadratics [11]
56. Algebraic Fractions [9]
57. Coordinate Graphing in 2-D [18]
58. Right Triangles [7]
59. Introduction to Trigonometry [10]
60. Slide Rule [12]
61.
62.
63. Distance and Angle Measure [10]
64. Parallels [5]
65. Triangles [7]
66. Polygons and Circles [6]
67. Similarity [4]
68.
69.
70.

UNIT SEQUENCE (continued)

71. Complex Number System [13]
72. Introduction to Relations and Functions [10]
73. Linear Relations and Functions [7]
74. Quadratic Relations and Functions [9]
75. Angles and Rotations [4]
76. Trigonometric Relations and Functions [8]
77. Graphs of Trigonometric Functions and Relations and their Inverses [5]
78. Exponential and Logarithmic Functions [7]
79. Special Operations [5]
80. Linear Open Sentences [7]
81. Quadratic Open Sentences [14]
82. Trigonometric Identities [4]
83. Use of Trigonometric and Logarithmic Tables [9]
84. Trigonometric Open Sentences [4]
85. Exponential and Logarithmic Open Sentences [7]
86. Computations with Logarithms [5]
87. Solution of Oblique Triangles [11]
88. Derivations of Trigonometric Formulas [9]
89. Systems of Open Sentences [8]
90. Sequences and Series [10]
91. Variation [5]

LCMV COURSE REQUIREMENTS

Math 9 (9BC)

Required Units:

44. Algebra Language [12]
45. Monomials [12]
46. Operations with Rationals I [16]
47. Operations with Rationals II [13]
48. Open Sentences - Equations [17]
49. Open Sentences - Inequalities [11]
50. Verbal Problems [5]
51. Sets of Numbers and their Properties [8]
53. Exponents [7]
54. Radicals [12]
55. Quadratics [15]
56. Algebraic Fractions [6]
57. Coordinate Graphing in 2-D [ ]
58. Right Triangle [ ]
59. Introduction to Trigonometry [10]

PLUS the Regent Exam as a final exam

Optional Units:

39. Flowcharts and the Use of the Calculator [15]
40. Manual Operation of the Programma 101 [16]
41. Programed Operation of the Programma 101 [ ]
42. Applied Graphs [6]
43. Business Tables [16]
52. Finite Systems [3]
60. Slide Rule [12]

Number of Objectives: 162

Pace:

a. To complete the work in one semester and allow 2 weeks for review before the Regents Exam - $2\frac{1}{2}$ objectives/day or 5 objectives every 2 days.

b. To complete the work in two semesters and allow 2 weeks for review before the Regents Exam - 1 objective per day.

c. To complete the work in two semesters and allow 4 weeks for review before the Regents Exam - 1.1 objectives per day or 11 objectives every two weeks.

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LCMV COURSE REQUIREMENTS

General Math (9E)

Required Units:

11. Integers I [14]
17. Ratio and Proportion [6]
27. Integers II [11]
28. Rational Number System [11]

PLUS any 4 other units from the optional list.

Optional Units:

12. Fractions [17]
13. Operating with Fractions [12]
14. Basic Units of Measure [10]
15. Decimals [11]
16. Operating with Decimals [15]
21. Measuring [8]
22. Some objects of Geometry [10]
23. Area [8]
24. Mathematical Systems [6]
30. Scientific Notation [7]
33. Real Number System [12]
34. Precision and Accuracy [7]
37. The Metric System of Linear Measure [6]
38. Lateral Surface and Volume [7]
39. Flowcharts and the Use of the Calculator [15]
40. Manual Operation of the Programma 101 [16]
41. Programed Operation of the Programma 101 [ ]
42. Applied Graphs [6]
43. Business Tables [16]
44. Algebra Language [12]

Number of Objectives: About 86 (42 in the required units; the other units average about 11/unit)

Pace:

a. To complete the work in one semester - 1 objective per day.

b. To complete the work in two semesters - 1 objective every 2 days.

LCMV COURSE REQUIREMENTS

Extended Algebra I (9D)

Required Units:
44. Algebra Language [12]
45. Monomials [12]
46. Operations with Rationals I [16]
47. Operations with Rationals II [13]
48. Open Sentences - Equations [17]
49. Open Sentences - Inequalities [11]
50. Verbal Problems [5]

Optional Units:
39. Flowcharts and the Use of the Calculator [15]
42. Applied Graphs [6]
43. Business Tables [16]

Number of Objectives: 86

Pace:
a. One Semester - 1.2 objectives/day or 6 objectives / week
b. Two Semesters - 1 objective/ 2 days.

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LCMV COURSE REQUIREMENTS

Extended Algebra II (10D)

Required Units:

51. Sets of Numbers and their Properties [8]
53. Exponents [7]
54. Radicals [12]
55. Quadratics [15]
56. Algebraic Fractions [6]
57. Coordinate Graphing in 2D [ ]
58. Right Triangle [ ]
59. Introduction to Trigonometry [10]

PLUS the Regents Exam as a final exam.

Optional Units:

39. Flowcharts and the Use of the Calculator [15]
40. Manual Operation of the Programma 101 [16]
41. Programed Operation of the Programma 101 [ ]
42. Applied Graphs [6]
43. Business Tables [16]
52. Finite Systems [3]
60. Slide Rule [12]

Number of Objectives: 76

Pace:

a. To complete the work in two semesters with four weeks allowed for review before the Regents Exam - 1 objective/2 days

b. To complete the work in one semester and allow two weeks for review before the Regents Exam - 1.2 objectives/day or 6 objectives per week.

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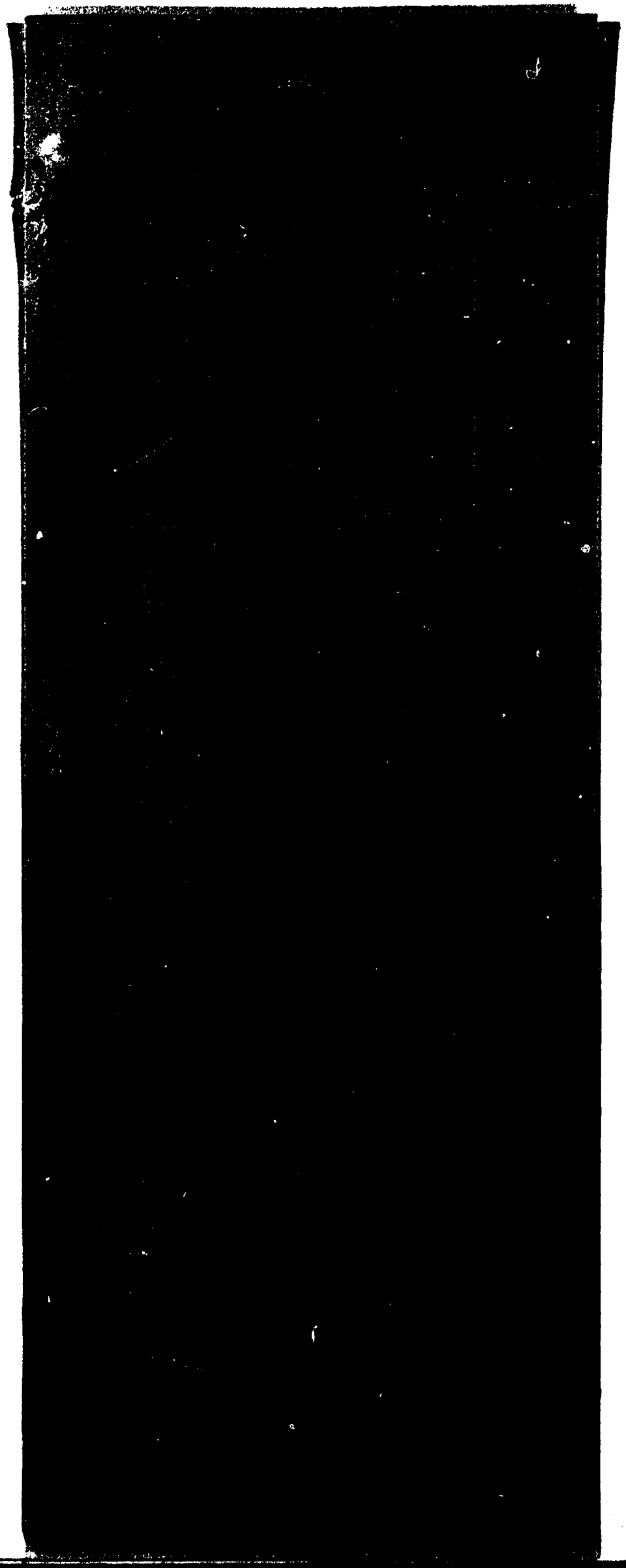

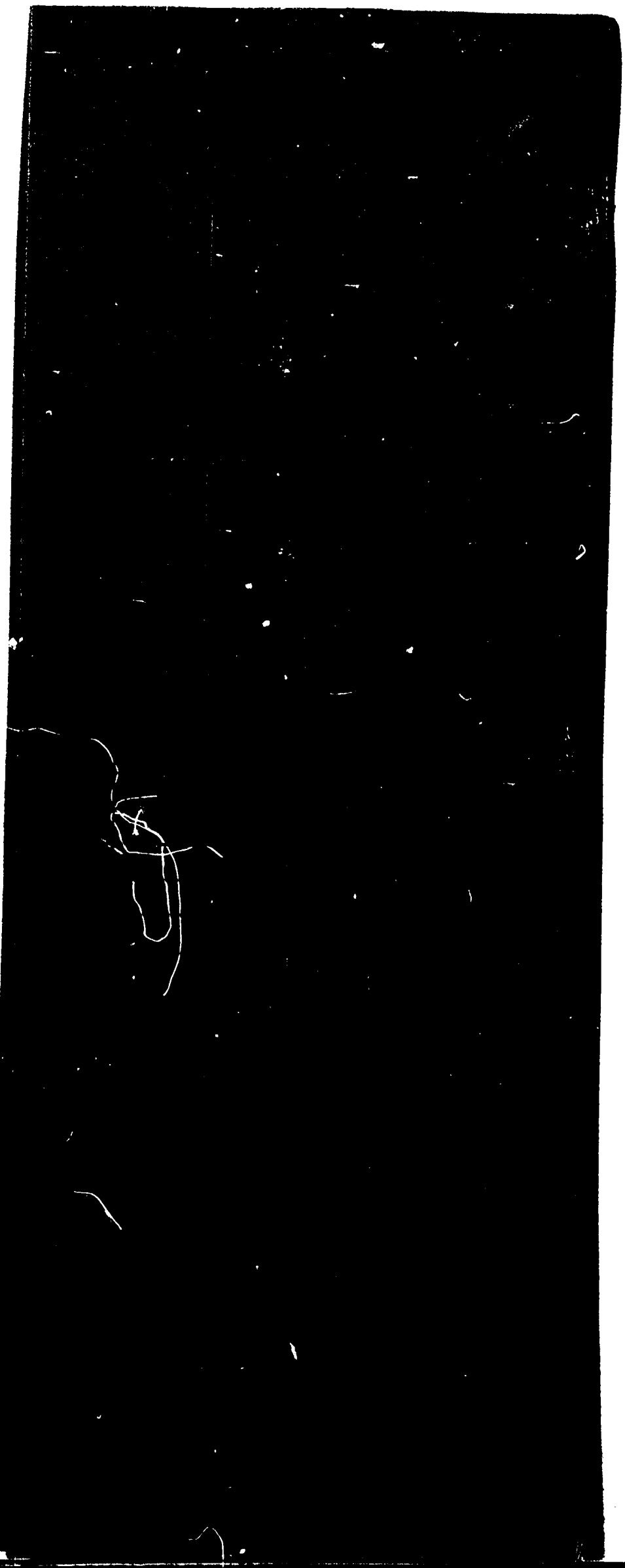

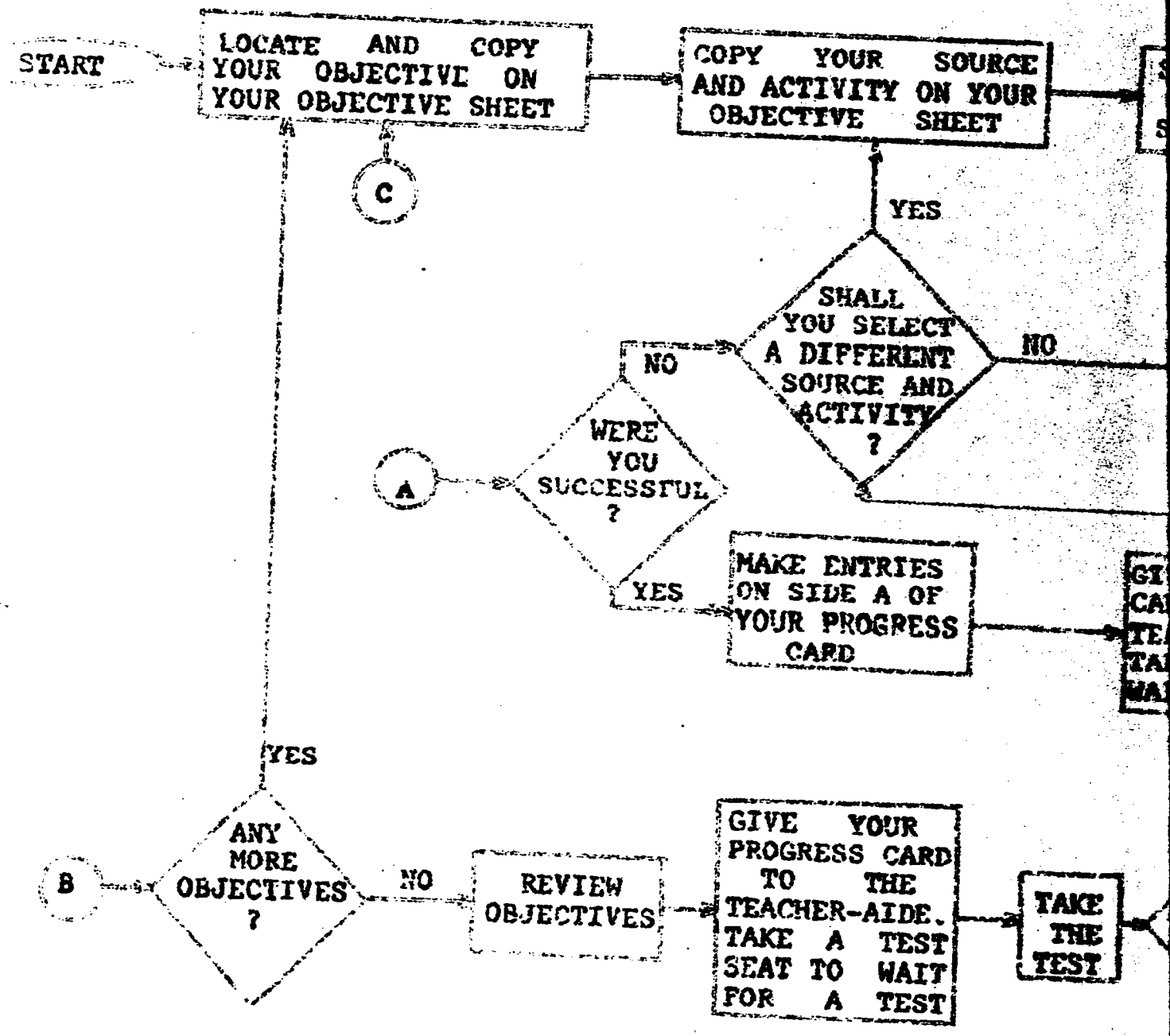
START
LOCATE AND COPY YOUR OBJECTIVE ON YOUR OBJECTIVE SHEET
COPY YOUR SOURCE AND ACTIVITY ON YOUR OBJECTIVE SHEET
C
YES
SHALL YOU SELECT A DIFFERENT SOURCE AND ACTIVITY ?
NO
NO
A
WERE YOU SUCCESSFUL ?
YES
MAKE ENTRIES ON SIDE A OF YOUR PROGRESS CARD
YES
B
ANY MORE OBJECTIVES ?
NO
REVIEW OBJECTIVES
GIVE YOUR PROGRESS CARD TO THE TEACHER-AIDE. TAKE A TEST SEAT TO WAIT FOR A TEST
TAKE THE TEST

L C M STUDENT ACTIVITY